

INDIAN SHIPPING

A HISTORICAL SURVEY

BALDEO SAHAI

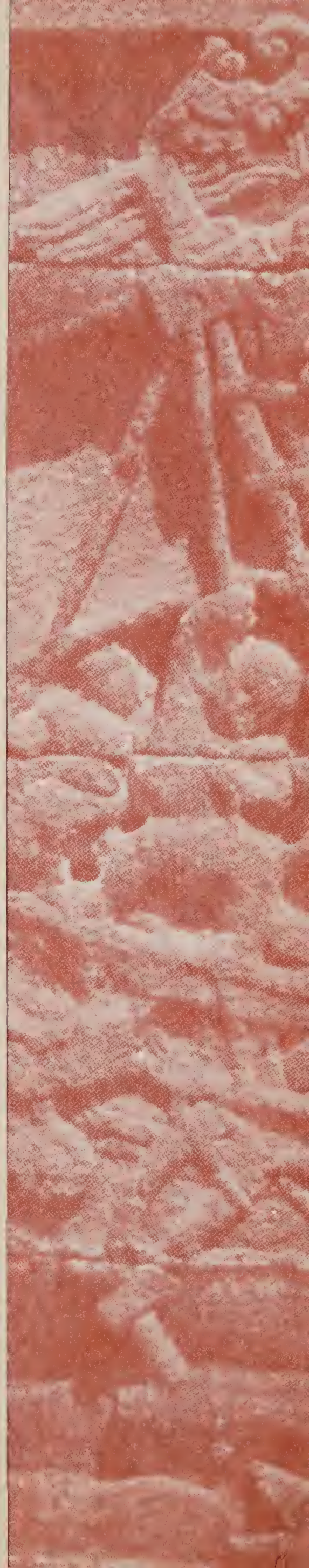


ABOUT THE BOOK


“...About the present volume I can only say that it is a scholarly and unique work written in a style which makes it not only highly informative and educative but also immensely readable” says Dr. C.P. Srivastava, Secretary General Emeritus, International Maritime Organisation, U.N. in his Foreword to the book. Recipient of decorations from Kings of Sweden, Norway and Spain and a Knighthood from the Queen of England, Sir C.P. adds, “Furthermore, it is the only book which provides a complete history of India’s many-faceted maritime activity from the earliest times right upto the present day”.

The author, referring to the glorious era of Indian Shipping in Southeast Asian region, asks: “Why the Hindu kingdom of Funan fell, Srivijaya collapsed, Shailendras bowed out ?... They had raised powerful navies, conducted successful expeditions and were not wanting in the art of warfare.” And answers, “Geography was against them and played a major rôle in shaping history... Perhaps it is the eternal discontent in the human heart which compels man to move up, reach a plateau, and again make a push to climb another peak. How long he manages to stay at a peak depends upon how wide a plateau the peak has”.

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Baldeo Sahai

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Foreword

India's maritime tradition has great antiquity. Archaeological discoveries made in Gujarat have established that India was a seafaring nation five thousand years ago and that the sea route to India had become, over the centuries, a vital artery in the flow of commerce and cultural exchange between our subcontinent and the rest of the world. In his book, 'Indian Shipping : A Historical Survey' Mr. Baldeo Sahai has performed a very important task in creating an excellent source book of information on the evolution and development of Indian Shipping.

From the days of the Indus Valley Civilization, the coastline of Gujarat was dotted with important ports, like Lothal, which has been dated by the Carbon 14 method to 2000 BC. The advanced technology used in building these ports must have taken a thousand years to develop. A number of Indus Valley seals and terracotta artefacts depict a craft with a mast and a yard in the background, indicating the existence of seagoing vessels.

Experts like Charles Verlinden, Chairman, International Commission for Maritime History, Brussels, say that around 3000 BC., Indians were navigating to Mesopotamia and Egypt. Alan Villiers, a well known explorer, who circumnavigated the earth in 1934-36, regards the Indian Ocean as the birthplace of sailing in the world. Stories about voyages on the high seas are found in the oldest book of the

world, the *Rigveda*, as well as in epics like the *Ramayana* and the *Mahabharata*. Indians sailed to the island of Socotra (Sukhatara) and the eastern coast of Africa. Later they sailed to the countries of Southeast Asia as far east as Borneo and the Celebes, where they raised empires and have left there some of the best specimen of architecture and art; the empires of Srivijaya and Shailendra flourished right up to the fourteenth century.

The art of shipbuilding was fostered in India with the advantage of scientific technology which had already been developed here. India pioneered the sciences of astronomy, mathematics, metallurgy and tool making. Even Harappans used metals like copper and bronze and knew grinding, boring, flaking and moulding. As the country abounded in timber, cordage and cotton, the craftsmen worked hard to build sturdy seagoing vessels. In the fifth century, Aryabhatta propounded the theory that the Earth is spherical which revolves on its own axis as well as round the Sun. This was a breakthrough in the art of navigation and gave great help in finding the directions in which the sailors desired to sail.

For over 4500 years Indian overseas trade flourished peacefully. However, in the 15th century, the Portuguese arrived in India and claimed sovereignty over Indian waters and monopoly of trade in certain commodities. They were opposed by the Maratha fleet of Shivaji but with the successive Dutch, French and British onslaughts, the Indian fleet suffered serious setback. However, with the advent of the twentieth century, India's maritime activities were revived. After the attainment of Independence, India has made notable progress in the maritime sector and has come to occupy a prominent place among the maritime nations of the world.

Mr. Sahai has undertaken a stupendous task in covering the fascinating story of Indian shipping and shipbuilding so comprehensively on the basis of painstaking and impeccable research. He has also dealt with the political, economic and social conditions prevalent from time to time which directly impinged upon trade and commerce, including the overseas trade. The economic prosperity of the country as well as the contribution made by Indian sciences to the art of navigation has also been highlighted. At the same time, Mr. Sahai has pointed out objectively where the Indians failed, and why.

I have gone through the pages of the manuscript and have no reservation in saying that Mr. Sahai has done an admirable job. With his background of having served the then Ministry of Shipping and Transport, and having already done a book on the *Ports of India*, Mr. Sahai has dealt with the subjects of shipping and shipbuilding with deep insight and a rare historical perspective. About his book on *Ports of India*, the late Dr. Nagendra Singh, former President of International Court of Justice at the Hague, and Secretary in the Ministry of Shipping, said in his foreword, “Mr. Sahai’s virtuosity as a writer and author of several books has converted a dull subject into an interesting experience.”

About the present volume I can only say that it is a scholarly and unique work written in a style which makes it not only highly informative and educative but also immensely readable. Furthermore, it is the only book which provides a complete history of India’s many faceted maritime activities from the earliest times right upto the present day. The progress made by India in the maritime sector since the attainment of independence has been specially highlighted. Having a holistic approach, the book will be found

useful as much by the vast maritime community in India as by all those in India and abroad who are interested in Indian history and culture.

C. P. Srivastava

Secretary General Emeritus,
International Maritime Organization, U.N.

Introduction

It is difficult for those living in the present to write about the past. The more distant the past, the more imponderable is the task. Yet the people are prone to undertake the exercise in the hope that they may add a strand or two to the multi-coloured tapestry of human history. The present to a great extent has emerged out of the past, and both are of considerable significance in fashioning the future.

The history of shipping and shipbuilding began in an age when writing was not known. For that period our main sources are archaeological finds, anthropological and ethnic studies; artistic, numismatic and epigraphic evidences and analysis of the evolving social, economic and political ideas. To these has been added the new discipline of marine archaeology. We have to examine the drawings on pottery and potsherds, or what is hauled up from the seabeds. Help has been taken of cuneiform tablets and hieroglyphs. The seals of Indus valley are of greater relevance to us but no one as yet has been able to 'read' them. In the case of archaeological material, since some of the earlier opinions have been modified in the light of later excavations, an attempt has been made to go by the latest. There is a possibility that even these may be revised when fresh finds become available. Sometimes the same material has been interpreted differently by various scholars.

In dealing with written material - in manuscript and print - what was produced by contemporaries may have an

edge over those who wrote subsequently. But the contemporary authors are more likely to be influenced by those around and may not have been in a position to view events in the right perspective. Those who write later with the advantage of a hindsight, may have already formed their opinions and would naturally highlight them. Some may be openly biased for or against a region or a regime and present past events in a manner so as to buttress their own bias. India has certainly been a prey of such prejudice from several quarters. As such, it is difficult to expect an entirely objective interpretation of the past. Whenever an authority has been quoted, it is to be taken as illustrative - to elaborate, explain or emphasise a point. It is only one aspect of truth which has many facets. The ages differ, the contexts differ and with that the interpretation of ideas and events differs.

For a long time only kings and queens made history. The accounts of battles they fought, the imposing buildings they constructed, the arts and architecture they patronised, the style of their administration and the type of justice they dispensed, formed the bulk of books on history. The people at large were mostly marginalised. It is only in recent times that the common man - a most elusive person - also started commanding some attention. With that the social and economic developments also earned a few pages. The interaction of technology and society is now being studied and a more balanced view taken of the various actors on the world stage.

The next phase in the handling of history giving greater emphasis to the evolution of ideas is now emerging. This development is the most difficult to discern as in the same culture the people in the Stone Age may be found rubbing shoulders with those splitting the atom or designing a gene.

Sometimes even a most enlightened person may not be able to dislodge some mental fossils. There is an apocryphal story that when some scientists visited the house of the famous physicist, Niels Bohr, they saw a horse shoe hanging at his door. When questioned about such an obvious demonstration of a popular belief, Bohr is said to have replied: "I am not at all superstitious but a horseshoe at the door does bring good luck."

Another problem in writing about the past is that the writers are inclined to evaluate the past with the yardstick of the present. That is patently unfair. As far as possible, efforts should be made to penetrate into the spirit of the period and judge those events by the conventions then in vogue. Whereas some values are of abiding nature, many others keep on changing as time rolls on. It may be improper to judge a whole race by the deeds, or misdeeds, of a few, or to totally ignore the contribution of a people because some of them perpetrated brutalities over others.

Alexander's attack on the Persian satrapy in Punjab has been blown up as Greek invasion of India whereas the facts are that his army refused to enter much of Indian territory 'where even women are known to fight for their freedom.' Whenever some historians have talked of India, what they have meant is actually a very small part of it, may be Sind, or Gujarat or at the most northern part of the country. While describing the atrocities committed by the Portuguese on the people of western coast, particularly the Muslims, we have given high praise for their nautical achievements.

In dealing with Indian shipping, we have tried to take a holistic view and treat the subject with reference to

political, economic and technological developments. Shipping or navigation is a composite art, it cannot be treated in isolation. First, a craft is required to venture on a river or sea. Shipbuilding - whatever its form or stage of development - has to precede shipping. The vessel has to be guided through winds and waves, rocks and reefs, bends and bars to reach a specific destination. Some information about these had to be acquired in the school of experience through the medium of keen and constant observation.

In the absence of mechanical implements to find the direction of a destination, early sailings were undertaken with the help of permanent celestial signposts in the sky - the sun, the moon, the planets and the stars. Sailing during day by the sun and at night by the stars is called 'primitive navigation'. Here the sailor divined the depth of the ocean by the colour of seawater or by observing marine life. He felt the wind on his body and smelt land from a distance. He had to depend mostly on his sharp senses and handled emergencies with the help of sheer human ingenuity.

Sailing on water was not like walking on land and involved far greater risks. In addition to a spirit of adventure to explore the unknown, there had to be enough motivation to risk one's life. That motivation was to find new sources of food and other articles for barter and, later, commerce. Availability of natural products depended upon the fertility of the soil and suitable climate. The economic status of a country was based on good administration by a political power. If the rule was centralised it helped in standardisation of products, better means of transport, organisation of merchant guilds, a flourishing shipbuilding industry and putting up good ports with all the concomitant facilities. In early stages only raw materials must have been bartered.

Later the manufactures would have entered the markets.

But it takes two to trade and if Egyptian civilization is placed around 5000 BC, the other two most ancient civilizations of the region - Mesopotamia and Indus Valley - would not have taken too long to come up, if they were not exactly contemporaneous. The communication among these regions was not confined to overland trade routes and involved seas voyages as well. If there were boats and ships on the Mediterranean and the Red Sea in 7000 BC, there is no reason why there were no ships on the Arabian Sea and Indian Ocean. Alan Villiers, who had sailed a good deal in and around the Indian Ocean with sails and steam, in the trade zone and in Roaring Forties and spent about a couple of years in circumnavigating the earth, is of the opinion that 'Indian Ocean is the birth place of sailing in the world'.

In narrating the exciting story of Indian Shipping and shipbuilding we have tried to begin from the beginning. Perhaps the idea of sailing might have occurred to early man when he saw a log of wood floating in water. He might have then dug out the log and 'invented' a canoe in which he paddled along with exhilaration. Once he devised tools to saw the wood, drill holes and stitch planks, sailing on seas gained momentum. At least for 5000 years from now shipping on high seas was well-established. India has been blessed with the bounties of nature making it a 'Land of Desire' to which many peoples from many lands flocked. The seas of India enjoyed the unique feature of regular trade winds called Monsoons. Clear skies over the entire region for at least eight months in a year was another boon which encouraged the study of astronomy and mathematics. With the help of these sciences emerged details like *nakshatras*, their degrees, solstices, equinoxes and so on, so essential for navigation.

There are numerous references to nautical terms in the Vedic literature. From the very early period the Indians and Arabs collaborated in the development of navigation. The Arabs acted as the intermediaries in Indian trade with the neighbouring countries, and then with Europe. Therefore a chapter has been devoted to Indo-Arab relations.

Since the days of the Buddha, Indian merchants and missionaries had been going to various parts of the world, particularly to Ceylon and Southeast Asian countries in ships. Prince Vijaya's visit to Ceylon in the sixth century BC is well attested and forms a favourite subject of Indian artists. In the beginning of the Christian era, or a little earlier, Indian sailors went to Southeast Asian region in large numbers. Some of them set up kingdoms in the Far East and have left behind exquisite specimens of art and architecture during their rule extending over a thousand years. That was a glorious period of Indian shipping and cannot be ignored. Shipping and shipbuilding was a flourishing industry during the reign of the Mauryas when a full-fledged department of shipping was set up. The traditions were further streamlined in the regime of imperial Guptas. Some portion has been devoted to these developments to keep continuity of the story.

For the next thousand years, thirty two sultans sat on the throne of Delhi which was almost a barren period as far as shipping is concerned. Then the scene shifts to South India when the Cheras, Cholas and Pandyas excelled in navigation and fought many naval battles with Ceylon, and farther east with Srivijaya and Shailendra kings. At that time the entire coastline of India was dotted with many ports and shipbuilding centres. The people of Gujarat, Konkan, Malabar coast, Tamil land, Vengi, Andhra, Kalinga and Banga were all carrying on vigorous trade with the Southeast region.

Many merchants had their trade representatives in countries in the east and the west. It is a pity that early Indians traded with European countries through West Asian routes, mostly with Arabs as middlemen, and did not pay as much attention to go to Europe over the high seas as they did in voyaging to Southeast Asia.

At the time of the advent of Portuguese towards the end of the fifteenth century, India was a house divided. The only semblance of a centralised power was in the South in the Vijayanagar Empire. On the west coast the Zamorins of Calicut and on the south eastern coast the Cholas wielded great naval influence. The maritime trade till then was being carried on for millenniums quite peacefully. The ports were not fortified and the ships were not armed.

The entry of the Mughals was thirty years hence. Coming from landlocked areas, they had little idea of an ocean or the potentialities of overseas trade. They showed a lot of interest in building boats and cruising on rivers. Akbar the Great saw the sea for the first time when he conquered Gujarat. But he maintained an Imperial *Nowwara* and could collect 30,000 boats at short notice. His son Jahangir fought many naval battles in Bengal, Assam and on the Arakan coast. Though technically riverine, these engagements involved hundreds of floating batteries, a variety of warships and great resourcefulness in negotiating numerous confluences of the mouths of *Bhagirathi* and *Brahmputra*, sometimes as vast as sea.

The Portuguese completely changed the complexion of Indian shipping. The Indian response to their high-handedness has been dealt with in a separate chapter and overlaps with the stiff resistance offered by the Zamorins, the Mughals and the Marathas. Aurangzeb was one emperor who could have raised a powerful navy and successfully

confronted the foreign powers. But it was not to be. The Mughals preferred the easy alternative of employing Abyssinian Siddis as their admirals who were good enough to carry on running battles with the Marathas.

All other European powers have been covered in a separate chapter. Among them the Dutch helped in ousting the Portuguese and the French found themselves no match to the English. New systems of managing trade and commerce through joint stock companies were introduced. On account of depleting supply of oak in England, and abundance of the entire range of shipbuilding materials in India, even the European merchants built an increasing number of their ships locally. The Malabar teak was acclaimed by many as the best timber in the world for constructing ships. In the north-eastern sector, *Sundari* oak was considered by some as more durable. There was mutual exchange of technology in which Indians were greater beneficiaries. Thus the shipping industry got a fillip and their technical expertise and instrumentation improved.

The high water-mark was reached in the vessels turned out by the Parsi dockyard at Bombay. Once the Portuguese and the Dutch were out of India, and French were subdued due to wars on the mainland, the English started gaining more and more power. The Marathas on the west coast and Haider Ali in South were then the main powers to go down fighting. After the last conflagration when the patriots rallied round the titular Mughal head, Bahadur Shah Zafar, the East India Company was wound up and an empire fell in the lap of the Queen of England.

The British Government supported to the hilt, their own shipping interests in India. The Indian shipping struggled to secure a place for itself under the sun. In this unequal battle a number of national companies fell like nine pins. The

movement was taken to legislative bodies and it became almost a part of national struggle for freedom of India. In this battle, the Scindia Steam Navigation Company played a prominent role.

After Independence in 1947, a comprehensive plan for the development of shipping industry was drawn up. The plan had four main planks : to increase shipping tonnage by acquiring modern vessels; to modernise ports so as to handle these vessels; to set up marine training institutes to raise efficient navigators at all levels; and to augment shipbuilding and dry docking facilities. Over 60 shipping companies are now functioning, the Shipping Corporation of India alone owning nearly 50 percent of the total tonnage. The training institutes enjoy international prestige and a number of cadets from neighbouring countries are on their rolls. There are five major shipyards and nearly 40 minor ones. The story of Indian shipping which began around 3000 BC has been brought up-to-date, including the fallout of economic liberalisation measures introduced in July 1991.

Syed Sulaiman Nadvi and George F. Hourani have done a good job in writing about Arab seafaring. K.M. Mathew, M.N. Pearson and others have thoroughly studied Portuguese navigation. Jean Sutton has produced a fine work on the activities of the English East India Company. Atul Chandra Roy gives extensive details about the naval battles fought by the Mughals as B.K. Apte has dealt with the Maratha navy and merchantships. In concentrating on a particular period, one is in a better position to do greater justice to the subject. But to attempt the story of Indian shipping and shipbuilding extending over 5000 years naturally makes the treatment rather diffused.

We have not completely confined the treatment to shipping alone which we think is an outcome of the

interaction of many forces—geographical, historical, economic, social, racial, religious, to name a few. Most of these topics have been touched upon in so far as they happen to influence shipping. Our approach has been that shipping is closely related to the socio-economic and political conditions prevalent in the country at a particular time. It has not been possible however to lay our hands on all the material available, and we are fully aware of many shortcomings. At best, it is an humble attempt to present the exciting story of Indian shipping and shipbuilding in a concise form.

Many organisations, scholars and friends have helped me in my modest work and it is not possible to mention them all by name. I thank the Indian National Science Academy - specially Dr A.K. Bag - Executive Secretary & Head, History of Science Division - who allotted the project to me, the late Mr. N.R. Chandran, former Director, Bharatiya Vidya Bhavan, who sponsored it, and the Publications Division for kindly publishing the book. Mr Moosa Raza, at present Secretary Steel, Government of India, guided me in the preparation of bibliography, particularly about the Muslim period. Mr. A.J. Kidwai, Hony. Director, Mass Communication Research Centre, Jamia Millia Islamia, gave valuable advice and put me in touch with Khuda Bakhsh O.P. Library, Patna where Dr. A.R. Bedar was a great help. Mr. K.N. Dikshit, Director, Archaeological Survey of India, gave me good material and photographs. Dr. L.M. Singhvi, High Commissioner for India in the UK; Mr. R.E. Cavaliero of Charles Wallace India Trust, Kent; and Dr. Lokesh Chandra, Director, International Academy of Indian Culture, New Delhi, took keen interest in the project. Director of St. Xavier Centre of Historical Research, Goa, Dr Teotonia R. de Souza, supplied me with some literature on Portuguese shipping.

In this field, NISTADS (National Institute of Science, Technology and Development Studies) New Delhi, has done remarkable work and its research teams have already covered several maritime states collecting oral traditions which throw a flood of light on past practices. Dr. Ashok Jain, Director, gave me full facilities to go through all the reports and print material, and his colleague Dr Satpal Sangwan, lent me some useful notes. Mr Ausaf Ali, Director, Indian Institute of Islamic Studies, gave personal attention in collecting suitable books for me from his well-stocked library. The National Library, Calcutta supplied a list of books on the subject. Many heads of history department and experts in nautical science gave valuable suggestions. I thank them all from the core of my heart. I am grateful to all the learned authors whose works I have consulted and quoted.

The study was supplemented with interviews with a variety of people. Talks with Admiral L. Ramdas (Retd), and Naval Chief, Admiral V.S. Shekhawat, were very enlightening. Commander K.C. Anil Giri of Seabird Project, Karwar, the officers of the Ministry of Surface Transport and the Public Relations Directorate of the Ministry of Defence, supplied to me the latest information and resolved many navigational knots. Interviews with Dr. S.R. Rao of the National Institute of Oceanography, Goa, and Prof B. Arunachalam of Bombay University were very rewarding. Above all, I spent many hours with the sailors and boat builders on the western and eastern coasts who demonstrated how they have been making boats for themselves as well as for foreign customers, mainly from West Asia. I thank them all for their kind cooperation.

I am highly obliged to Sir C.P. Srivastava, former Chairman and Managing Director of Shipping Corporation

of India and later Secretary General, International Maritime Organisation (IMO) U.N., for sixteen years for very kindly going through the manuscript and writing the Foreword. In September 1994, King Jaun Carlos of Spain, conferred upon him the Spanish equivalent of a Knighthood - Encomienda De Numero De La Orden De Isabel La Catolica - in recognition of his outstanding service to IMO.

I am very grateful to Mr. Biman Sen, former UNESCO expert on Educational Planning and member of the National Commission for History of Science INSA, for going through some chapters and giving useful suggestions for improvement. My wife Pushpa and son Yogi (Yogendra Sahai, Chief of Corporate Communications of Indianoil) extended constant support and I am grateful to both. I thank Miss Olga Vaz for typing the manuscript and doing a neat job.

Baldeo Sahai

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CHAPTER I

Indian Shipping—The Beginning

Nature has conferred on India, what is called in modern parlance, the status of one of the Most Favoured Nations of the Earth. The Himalayan range in the north has some of the highest peaks and abounds in spots of matchless scenic beauty. It protects the country from the chilly winds of the Central Asian region and serves as a perennial source of water to the rivers which irrigate the extensive Indo-Gangetic plain. The mighty *Sindhu* with its five tributaries in the west, and the *Brahmputra* in the east, flow like two mighty arms. Between the two runs the holy *Ganga* which is joined by the *Yamuna* at Allahabad (Prayag), and both have many tributaries.

South of the plain lies the triangular tableland of the Deccan having some of the oldest rocks of the world. The Vindhya mountains, girdled by the two rivers, *Narmada* and *Tapti*, form the base of a reversed triangle with its two ranges running south separately in Western and Eastern Ghats. The Western Ghat is generally higher and a number of rivers cut into its rocky terrain flowing eastward and douching themselves into the Bay of Bengal. The Western Ghat also serves as a bulwark for the narrow coastal strip which had been the rendezvous of many nations, not always friendly to the hinterland. The peninsular part is surrounded by sea on three sides - the Arabian Sea on the west, the Bay of Bengal on the east and the vast Indian Ocean in the south.

The country has a coastline of about 6300 km. The island territories of Lakshadweep comprising 27 major islands, and the chain of Andaman and Nicobar including over 300 islands add another 1200 km. This coastline has 11 major, 20 intermediate and over a hundred minor ports.¹ With the application of new laws of sea to this coastline, a staggering 2.2 million sq.km. of Exclusive Economic Zone is available to the country. India's natural outlet is from the sea over which passes 97 percent of its trade accounting for Rs.72,000 crore² (1 crore=10 million) annually.

From ancient times nature has been lavish in bestowing its bounties on this land. The country could boast of agricultural surplus many millenniums before the birth of Christ which is an essential prerequisite for the growth of any civilization. That gave the people a lot of leisure to indulge in various arts and sciences. They devised tools to cut trees and turn them into different forms, pierce beads and make necklaces, mould mud and turnout pottery or they gazed at stars and watched their varying positions, sat down and tried to analyse the nature of things around, or just meditated to unravel the mystery of life and death.

The country abounded in a large number of tantalising products, some of them unique to India. Take timber for example, a large variety of trees growing at different heights on the Himalayas and the Eastern and Western Ghats. The Himalayan pine, locally known as *deva dāru* (corrupted as *deodār*) "the tree of gods", having trunks upto a circumference of twenty-five feet and rising to such great heights that they appear to be slim. Alexander the Great is said to have used this timber to build his fleet.³ But the teak of Malabar coast takes the cake. It is well-known as the best wood for building ships—long-lasting and free from attack by many

marine borers. Sandalwood—sweet-scented, fine-grained, superb - for making fine pieces of art was in great demand by the royalty.

A large number of medicinal plants, including the mythical *sanjivini booti*, a cure-all, an elixir of life, titillating spices and aromatic gums and grasses galore. Take *zāfrān*-exuding a delicate, delicious fragrance, an ingredient which is used in *biryani*, fit for royal palates. Even the poor pepper commanded such popularity that no banquet in ancient Rome or Athens was worth its name without a dash of oriental spices. For many centuries spices played a pivotal role in trade and commerce. Fortunes were spent in organising expeditions and sending merchants and explorers on hazardous journeys by land and sea to hunt for these delicacies wherever available. Even in animals, India could boast of exquisite varieties - tigers, elephants, rhinoceros, peacocks, hounds, and talking parrots. The country did not lag behind in minerals, pearls and precious stones.

No wonder, the German philosopher Hegel (1770 - 1831), called India “a Land of Desire”. He says: “From the most ancient times downwards, all nations have directed their wishes and longings to gaining access to the treasures of nature—pearls, diamonds, perfumes, rose essences, lions, elephants etc.—as also treasures of wisdom. The way by which these treasures have passed to the West has at all times been a matter of world historical importance bound up with the fate of nations.” He was not alone in singing the paeans of praise. An Arab merchant remarks in a poetic vein: “The Indian rivers are pearls, its mountains rubies, its trees perfumes”.⁴ Pliny (23-78 AD) calls India the “Mother of gems” and adds, “The Romans loved precious stones and India was the only country at that time which could export all kinds of gems.”⁵

It may be better here to clarify some concepts. Geographically, India in olden days was generally accepted as the land lying between Himalayas in the north and Kanyakumari in the south.* Arunachal Pradesh, Nagaland, Mizoram, Manipur in the east and Sind, Baluchistan in the west. Politically, 'India' stood for much smaller portions at various periods. Sometimes India meant only the western part of Sind, Gujarat, Saurashtra and Punjab, then gradually covering the entire Gangetic plain. Penetration of the Aryans into South India started around 1000 BC but that does not mean that the region was totally uninhabited. Secondly, to the earliest times till the birth of the Buddha, there was not much of a difference between a boat and a ship. Perhaps boats were smaller in size and those bigger were called ships. But a distinction was drawn between the boats/ships plying on rivers and those which sailed on seas. Thirdly, some advantages enjoyed by India for being a maritime nation were also shared by the neighbouring countries. For example, Arabia also had 'sea' on three sides - a narrow 1200-mile long Red Sea on the west unaffordable at some places due to coral reefs, comparatively small Persian Gulf on the east, and Arabian Sea on the south.

In the lower reaches of the rivers *Euphrates* and *Tigris*, where they fell into the Persian Gulf, grew another ancient civilization of Mesopotamia. Further west, Egypt had the Mediterranean in the north and its life-line, the river *Nile*, joined it with the Red Sea by a canal constructed as early as in 2000 BC.⁶ Therefore constant communication between India on the one side and the countries of West Asia on the other from time immemorial was quite natural. But none of these countries had all the necessary materials required for building boats or ships, nor were they so rich in natural

* *Himvat-Setu Paryantam*

resources of a vast variety. Therefore India enjoyed an edge over them.

Rounding the Cape

Wherever there are flowers, the honey-gatherers make a bee-line. So it was with India. The peoples mainly of the north-west journeyed to India overland but mostly by sea to buy or barter merchandise and sell it elsewhere. In the beginning, the Arabs acted as middlemen between India and Europe but gradually direct trade gained momentum. Indian merchants also travelled to distant lands with their products to make more profits. Their settlements in commercial centres of West Asian countries, the island of Socotra (*Dvīpa Sukhatārā*) and the eastern coast of Africa since ancient times are well attested.

They certainly knew Madagascar and whether they had rounded the Cape of Good Hope and sailed up to the west coast of Africa “is not known with certainty.”⁷ On the capability of the Asians in taking their ships to the west coast, Prof. Needham, the well-known historian, dismisses the insinuation that “Asian sailors never rounded the Cape of Good Hope because of want of courage rather than of technical equipment.”⁸ He remarks, “Assuming for the moment that they did not, it is extremely doubtful whether either of these propositions is true in any sense.”⁹ But Villiers is almost certain that a little later the Indian shipwrights had acquired sufficient refinement in technology to have rounded the Cape. “The superiority of the Indian-built vessels,” he opines, “goes back a long time.”¹⁰

The Monsoon Winds

There was another fortuitous factor for making India the hub of world commerce. The Indian Ocean region has the

unique feature of being served by Monsoons. The alternating high and low pressure extending from the Equator to the Himalayas give rise to two types of winds coinciding with the two equinoxes occurring in March and September. During the period when sailing crafts were not mechanised, and did not use steam or fossil fuel, the sailors mostly depended on the wind energy and on the muscles of men for rowing boats/ships. Fortunately the wind is not so wayward as it is said to be. It has more or less set patterns and, over the years, navigators were able to ascertain the direction in which a wind blows in specific months over particular portions of the oceans and seas.

On the western side of the Indian Ocean down to the Mozambique channel, in Arabian Sea, and Bay of Bengal, there are two monsoons, the south-west and the north-east lasting for six months each. The south-west monsoon brings rains to the western coast of India. At Bombay it arrives around May, lashing the entire western coast in July when it gradually steadies down and begins to break up about September. The western coast therefore is closed for shipping during these months of heavy rains. For most of the period it does not rain but pours even for a month or so at a stretch only with an occasional chink of fair weather. The north-east, on the other hand, "is as gracious, as clear and as balmy as a permanent trade"¹¹ and it is this wind that blows Indian dhows from the Malabar coast to Mombāsā and Madagāscar and wafts the argosies of Arabia on their long voyages from the Persian Gulf to Zanzibar and beyond. The monsoons, rightly called the trade winds, played a key role in the trade and commerce of ancient East with other parts of the world. Sometimes the west winds could blow a square-rigged ship from Good Hope to Australia in three weeks and less, a distance of about 6000 miles!

Alan Villiers, who had sailed a good deal in and around the Indian Ocean, recalls a voyage he made in a fully-rigged ship, *Joseph Conrad*, from Cape Town to Boeleleng in Bali, a direct distance of about 4000 miles as a part of circumnavigation during 1934-36. Had he sailed direct, he says, it would have taken many months entailing a lot of hardships. Instead, he chose a route to run before the west winds from the south of the Cape until he reached the longitude of Cape Leeuwin, then to turn north, work through the region of variable winds and utilise the south-east trades to sail northwards to the straits between Java and Bali. In this way he raced from off the Good Hope to the Cape Leeuwin in less than three weeks, his little ship at times “almost flying before the shrieking squalls.”¹²

Once you understand the ways of the winds in this region and have picked up how to put them to proper use at a suitable time of the year, it may be far more profitable - even safer - to sail on the high seas than along the coast in sight of land. It may therefore be not quite correct to surmise that the “ancient sea trade must have been largely coastal since the scientific knowledge necessary for open-sea navigation was not yet in hand.”¹³ The behaviour of monsoons was well-known at least to the sailors of India, Arabia and Persia from very early times, “and the mariners who reached China in the seventh century BC could not have feared sailing on the open seas.” In Chinese historical sources occur references to maritime traders “bringing typical Indian products to China as far back as the seventh century BC.” The Honorary Chairman, International Commission for Maritime History, Brussels, Charles Verlinden, confirms this view. He says, “We cannot exclude the possibility that China on the east and Africa on the west were both reached during the seventh century BC by Indian

navigation.”¹⁴ There is a possibility that Indians could have gone there even earlier. On the so-called ‘discovery’ of monsoons by Hippalus in 45 AD, Schoff says in annotation of *Periplus of the Erythraean Sea*, “But it is probable that Arabian and Dravidian craft had frequented that ocean for many centuries and inconceivable that they should not have made use of the periodic changes of the monsoons, *by far the most notable feature of their climate*.”¹⁵ The author adds, “The evidence of both countries indicates on the contrary, that they steered boldly out of sight of land, before records were written to tell of it.”¹⁶

Birthplace of Shipping

No wonder that the well-known explorer and maritime historian, Villiers, is firmly of the view that the Indian Ocean “was the birthplace of the art of sailing...”¹⁷ It was the great sea-way of the spice trade, the sea-route for China silk, and the ocean that Sindbad roamed. Its waters “washed the very cradle of mankind and its blue bosom bore the first sea-going ship.”¹⁸ It is a “fascinating ocean” rich in history and second to none in the story of the great lands. According to Villiers, Indian Ocean includes the entire area from Cape Agulhas, on 20 degrees East, down to the Antarctic, eastwards as far as Australia and Tasmania, and northwards to the east of Asia. The Erythraean Sea of *Periplus* included Indian Ocean as he knew it and its adjuncts, the Red Sea and the Persian Gulf. Villiers’ view of the Indian Ocean is more authentic and embraces all the waters on the west up to the Cape of Good Hope covering the total area of about 27,000,000 sq miles making it the third largest ocean after the Pacific and the Atlantic.¹⁹

The oceans and seas cover seven-tenths of the globe. Most of the land in that early stage had very dense forest

cover infested with wild beasts, some of them now extinct. Seeing a piece of wood or a log floating on water, the natural desire of the early man would have been to take to water with the help of a log. Wells therefore seems justified in his surmise that the “earliest boats and ships must have come into use some 25-30,000 years ago.”²⁰ With so much water around, a raft, a boat or an inflated skin must have preceded the wheel. Indian Ocean having thickly populated littoral countries must have been among all others, the busiest ocean from the most ancient times.

Of the six ‘pristine’ civilizations, Indian Ocean region accounts for half - in chronological order - Mesopotamia, Egypt and the Indus Valley. “There were ships upon the Red Sea and there were ships on the Mediterranean and Persian Gulf by 7000 BC,”^{20a} then why not on the Indian Ocean. The diffusionists claim that the Indus civilization is derivative from Mesopotamia,²¹ but some scholars are of the view that it was the other way round. It is because of the flourishing of such ancient civilizations, and the unique feature of the monsoons in the Indian Ocean and Bay of Bengal, that the sailing traditions did develop in this region “before any other part of the world.” Villiers challenges the “alleged development” of deep-sea sailing among the ancient Egyptians.²² “It is true,” he says, “that some of their vessels did go down the Red Sea...It is equally true that they did establish trade between lower Red Sea ports and Kosier. But rowing a boat along the coasts of the Red Sea, though arduous for the oarsmen, is scarcely ocean-going...”²³ He reiterates, “It is, I think, probable that real ships originated elsewhere along the shores of the Indian Ocean.”²⁴ He dismisses as “conjectures” that boats made of reeds, skins or wicker-work as in ancient Egypt of the Gerzean period, could ever muster strength to venture into the seas. Villiers regards it as “one of the few certainties that “long before the period when any

reconstruction can be based on written or sculptured records, there were seagoing ships, and some of them at least were plying for passengers and cargo in the monsoonal waters of the Indian Ocean.”²⁵

Indus Civilization

Till recently Indian civilization was being evaluated on the basis of Aryan culture as reflected in the *Rigveda*, our earliest literary source.²⁶ A few Vedic scholars continue to claim greater antiquity for the Vedic Age. But a consensus among historians gives that glory now to the Indus Valley. The first relics of India's oldest cities of this civilization were noticed by Sir Alexander Cunningham in his report for the year 1872-73, since then a number of excavations have been carried out at various sites including those in the Indian States of Rajasthan, Gujarat, U.P., Punjab and Haryana. The excavations show that the Indus Valley culture covers an area of at least 65,000 sq km and “no ancient prehistoric civilization covered such a vast area”. In all, around 2000 to 2500 seals have been unearthed at Harappa, Mohenjodaro, Lothal, Kalibangan, Chanhudaro, Ropar and several other places.

Agriculture was carried on in India even during the pre-Indus period. Evidence of agricultural technique is also found at Kalibangan located on the southern bank of the river *Ghaggar*, now running dry. B.B.Lal has identified “ploughed furrow marks regularly interspaced.”²⁷ “The terracotta model of a plough at Banawali found in the Hissar district of Haryana sets at rest all speculation about the non-existence of plough in the pre-Harappan civilization.”²⁸ The agricultural ancestry of the Harappan “goes back to the seventh millennium.”²⁹ D.K. Chakrabarti puts the period of Indus Culture not later than 2900 BC.

The archaeological excavations have brought to light an ancient urban culture of a very high standard. The twin cities of Harappa and Mohenjodaro were as well laid out as the La Corbusier's modern city of Chandigarh in as much as that the ground plan had large avenues cutting each other at right angles dividing the cities into large rectangular blocks. The main roads and lanes had uniform width and the street drainage system was linked with the residential drains. These cities have been acclaimed as "The earliest sites yet discovered where a scheme of town planning existed."³⁰ The advanced stage of standardisation indicates a universally accepted commercial code and a "uniform technique of production controlling the sizes of bricks, the capacity of pots and so on."³¹

The people had enough leisure to put to better use. Cotton plant at that point of time was found only in India. The people were well versed in the art of spinning and weaving.³² In fact cotton and its cloth formed one of the prized products of ancient India and accounted for much of its wealth and prosperity. Cotton was "exported by sea to the head of the Persian Gulf in the fourth millennium BC, and it found its way very early to Egypt."³³ The Harappans knew the use of metals like copper and bronze. According to Mackay, "There is every probability that in India lead-making was one of the most ancient arts..."³⁴ The technological history of sophisticated Indian jewellery and ornaments can also be traced back to Harappans. They had devised instruments to saw, flake, grind and bore stone beads to make beautiful necklaces.

It is inconceivable that the Indus valley people, who knew spinning and weaving, pottery-making, metallurgy, grinding, boring, flaking and moulding would have neglected

boat-building and sea-sailing. They were certainly carrying on flourishing maritime trade with various countries. A terracotta from Mohenjodaro depicting a boat has been found. It is dated between 2500 and 1750 BC. Sir Mortimer writing in 1953 found “a seal and a potsherd graffito from Mohenjodaro both of which show a craft with sharply upturned bow and stern of a kind paralleled in Crete, Egypt and Sumer.”³⁵ One of the representations shows a mast and a yard, the other a central cabin and a man at the steering oar.” He adds, “These may be river craft, but there is no reason to suppose that similar small ships were less venturesome than the Arab dhows of today..”³⁶

The Port of Lothal

S.R. Rao is of the view that Lothal was not only an excellent port displaying remarkable engineering ingenuity and skill, but also a boat-building centre. From the terracotta models of boats from Lothal, three major types are easily distinguishable (see photographs). Of these, two types had sails and the third was without sails. In another complete model, Rao opines, that a sharp keel, pointed prow and a high flat stern are seen alongwith three blind holes. One hole is near the stern, the other near the prow and the last near the edge of the boat, perhaps for fixing the mast. In other models, pointed keels, raised sterns and prows can be identified. In the third type flat base and pointed prow are prominent but provision for a mast is missing.³⁷ Rao thinks that the first two types of sharp-keeled boats with provision for the mast must have sailed on high seas, whereas the third type resembling canoes was used in the estuary only. On two potsherds found at Lothal painted depiction of multioared boats have been found, “which were most probably used in ancient Sind.”³⁸

There is sufficient evidence to show that vessels were anchored at Lothal with circular or triangular stone anchors having rectangular section and one perforated right across for passing the ropes. Somewhat similar stone anchors have been found off the coast of modern city of Dwarka through marine archaeology in 1984. In all, 14 stray building blocks of stone and two three-holed anchors weighing 100 to 150 kg were brought to surface by the second marine archaeological expedition conducted by the National Institute of Oceanography, Goa, under the supervision of Rao. These anchors are at display at the NIO office, Dona Paula. Dr Rao informed me that similar 3-holed anchors of Late Bronze Age have also been found at Ugarit in Syria and Kition in Cyprus.³⁹

Lothal dock decidedly is the earliest archaeological evidence for marine activity in India. It was built by the Harappans at the head of the Gulf of Cambay on Gujarat coast not later than 2300 BC. Rao discovered it in 1954 by chance as he was actually looking for Harappan settlements within the borders of India after partition. The measurement of the dock from north to south is 219 metres, and from east to west 37 metres. The brick wall all around is 4.5 metres. The ships coming from the Gulf of Cambay at high tide passed through a channel 3 metres wide and 2.5 metres long and then entered the dock. To safeguard the walls against the shock of sea water was constructed a platform of unbaked bricks of 12 to 13 metres. The platform towards the west measuring 240 metres by 23 metres was used for loading and unloading cargo.

India has perhaps the oldest port in the world in Lothal on the estuary of *Sābarmati* joining the Gulf of Cambay. In 2400 BC, Lothal was a small village which by 2200 BC grew

into a major port. In spite of natural calamities like repeated floods, the Harappans made all efforts to reconstruct the dock better than before after each flood. Between 2400 and 2350 BC only small boats could call at Lothal and the volume of trade was not significant. After the flood in 2350 BC, an artificial dock was added for berthing larger ships in greater number. It was to provide facilities for increasing volume of foreign trade and the need to sluice ships from the Gulf of Cambay into a dock that the structure was remodelled using engineering ingenuity unknown in the world elsewhere. "Originally as many as sixty-four cubical blocks each 3.6 m squares, and interlaced by 1.2 m wide passages, existed on a 3.5 m high podium of mud-bricks covering an area of 48.7 x 39.6m."⁴⁰ It was not the only port. On the Gujarat coast alone, there were more than a dozen other ports.

Great pains were taken to put up these ports because Indian ships laden with merchandise were leaving these ports and vessels of other countries were regularly visiting them leading to flourishing trade. During Phase III (2200-2000 BC) of rebuilding the township "Lothal extended its overseas trade to Egypt, Bahrain and Sumerian cities of Ur and Barak as attested by gold beads and terracotta models of mummy. Lothal imported copper and exported beads of gemstones besides ivory and shell objects."⁴¹ A large number of beadmaking factories and furnaces of goldsmiths have been unearthed at Lothal. Etched carnelian beads and "non-etched long barrel beads have been found as far as in Kish and Ur (Iraq), Jalalabad and Susa (Iran),"⁴² proving that these were in great demand by the women of those countries. "Their occurrence in pre-Sargonic level is a pointer to a very early date, namely C 2300 BC for their export from

Harappan sites.”⁴³ The Lothal goldsmiths made the “most attractive item of costume jewellery”⁴⁴ in a necklace of micro-beads of gold in five strands. Even today bead-makers of Cambay export their products to West Asia, Africa and Europe following almost the same age-old techniques.

The Lothal engineers, says Rao, must have been far ahead of the rest of the world in designing and constructing an artificial brick structure to sluice ships at high tide. The fact of their ensuring floatations of ships at low water by introducing a water-locking system speaks highly of their skill in marine engineering. He adds: “The identification of a trapezoid structure as a dock, presence of painted pottery of Sumerian origin and the occurrence of a Persian Gulf seal at Lothal have given a new emphasis to the maritime activities of the Harappans.”^{44a} More than a dozen Harappan (2450-1900 BC) and post-Harappan (1900-1500 BC) ports have been discovered during the past several decades. Awra, Lakhabawal, Prabhasa (Somnath) and Megham are some of the late-Harappan ports excavated in recent years. Relying on C-14 method, D.P. Agarwal has suggested a maximum spread of 2200-1700 BC for Lothal.⁴⁵ Thus, on the basis of authentic archaeological evidence, the antiquity of Indian shipping has been firmly pushed back to more than 5000 years from now. To reach that stage, experimentation in the art of shipbuilding, marine engineering and navigation must have taken a thousand years or more.

Fourth millenary BC, in fact, was dominated by traders and marked the cardinal epoch in the commercial history of India. “These commercial people caused the first Industrial Revolution (which then was of no less significance than the later Industrial Revolution in England) and after that India became an industrial and a great exporting country.”⁴⁶ Says

Dr Suniti Kumar Chatterji, the well-known historian, “It seems that Chaldean and western Asiatic, and also probably the Aegean elements, is the oldest stratum of Indo-Dravidian culture. The Dravidians did not travel from South Europe to India, but from India to South Europe. Their seafaring activities for the purpose of trade from the very ancient times add probability to this possibility.”⁴⁷

More historical and archaeological evidence has piled up over the years to support the views of Chatterji. Further excavations at various sites have yielded admission that “India confronts Egypt and Babylonia by the third millennium with a thoroughly individual and independent civilization of her own, *technically the peer of the rest*”.⁴⁸ The Lothal merchants sent their ships to distant ports in the Persian Gulf and beyond. “The excavations at Ras Shamra have revealed that ivory rods, now suspected to be of Indus valley workmanship, reached as far as the north Syrian coast...The merchants had established colonies outside their homeland and used specific types of seals prescribed by the local rulers or merchant guilds. For example, cylinder seals were brought into vogue in the *Euphrates-Tigris* valley, circular stamp seals in the Persian Gulf islands and square or rectangular stamp seals in the Indus Empire.”⁴⁹ Conversely, “at Clysma near the Suez, a Byzantine official was stationed, who was obliged to visit India annually and to report on trade and political conditions.”⁵⁰ The distinctive Indus seals, “carved with their unread writing and with figures of gods and fantastic animals have been found at several Sumerian cities”⁵¹ like Tel Asmar and Ur, confirming close interaction between the two regions.

A reputed scholar of Maritime History, Brussels (Belgium), Verlinden opines that around 3000 BC Indians from

the Indus Valley had established maritime contacts with Mesopotamia and Egypt. "This implies not merely knowledge of coastal navigation," the writer clarifies, "but also of the monsoons and the maritime currents."⁵² Many other scholars have established "that there was direct commerce between Babylon, at the head of the Persian Gulf, and India, more than 3000 years before the birth of Christ." Such a commerce would have been impossible without hundreds of years of prior exploration by sea, and of slowly nurtured attempts at trading. There is a record that the Egyptian king Snefru sent a fleet of forty ships to Phoenicia about 3000 BC to bring back logs cut in the forests of Lebanon."⁵³ Indian products which were in great demand the world over, Villiers adds, included besides fine muslin and timber, aromatic spices, sweet incenses, ivory and sandalwood found mostly on the Malabar coast.

Logs of teak wood were cut on the Malabar coast and shipped to the Persian Gulf in vessels large enough to carry them. "In the ruins of Mugheir, ancient Ur of the Chaldeas built by Ur-Êâ, (or Ur Bagash)... who ruled not less than 3000 years BC, was found a piece of Indian teak. This evidence is exceptionally conclusive," according to Ragozin, "because, as it happens, this particular tree...grows in southern India (Dekhan) where it advances close to the Malabar coast, and nowhere else."⁵⁴ Rao however says that teak grows in abundance in the Panchamahar district of Gujarat also and "was used at Lothal in 2200 BC as can be judged from the charred wood specimen found in the dockyard."⁵⁵

In an old Babylonian list of clothes dating back to the reign of the same king Bagash of United Babylon, according to Dr. Sayce, the famous Assyriologist, the word *Sindhu* has

been used for muslin. It is "the clearest proof that there was trade between Babylon and the people who spoke an Aryan dialect and lived in the country watered by the Indus." This is confirmed by Ragozin who says that "the old Babylonian name for muslin was *sindhu*, that is, the stuff was simply called by the name of the country which exported it."⁵⁶ She also points to the use of the word *mana* as early as the *Rigveda* to denote a definite quantity of gold (*RV VIII, 67 and 78-2*) - "a word which can be traced to ancient Chaldea, or Semitic Babylonia, with the same meaning, and which afterwards passed into the greek monetary system (*mnâ*, later Latinised into *mina*)."⁵⁷

A Karnataka University historian of the Department of Studies in Ancient Indian History and Epigraphy, Prof. A. Sundara has pointed out that some distinctive archaeological remains suggest contacts between the region of the Nile Valley and Karnataka possibly along the coast in the proto-historic period. "A terracotta head-rest found in a stratified neolithic burial at T. Narasipur (Seshadri M., 1971) and also in the neolithic culture in Hallur (Nagaraja Rao, M.S., 1971: 87-98) are reminiscent of similar head-rests of ivory, lapis-lazuli, blue faience, turquoise, and blue glass from the tomb of Tut-Ankh-Amen, Pharaoh of the late XVIII dynasty (1587-1375 BC) of Egypt found in the Valley of the Kings datable to circa 1400 BC."⁵⁸ Such a head-rest has not been found in any other neolithic site north of the *Tungabhadra* and the head-rest from Jhukar is distinctly different from that of the Egyptian. Prof Sundara adds: "The above close similarities in the proto-historic objects datable from circa 1400 BC onward cannot be simply brushed aside as accidental for they are both substantial and uncommon."⁵⁹

A veteran Japanese sailor, Akira Iwata, member of the 'Association for the Restoration of the Sumerian Ship'

thinks that the “ancient maritime Silk Route” was used by the peoples of Sumer and India about 4000 years ago. He believes that because of the remarkable similarities between the techniques and materials used for building old Sumerian ships and the traditional techniques and materials used in the Kozhikode area of South India “such ships were built in India about 4000 years ago.”⁶⁰ Iwata has designed a ship based on one of the 500,000 terracotta tablets with cuneiform characters unearthed in Mesopotamia. The tablet classified as AO-5673, dating from 2040 BC, carried a description of how to reconstruct a 120 GUR (30 tonnes) ship.⁶¹

It is well documented that in the middle of the tenth century BC, the ships of King Solomon brought gold, silver, ivory, almug (sandalwood), precious stones, rice, apes, peacocks and other articles typical of Indian origin, from Ophir and its twin city, Tharshish.⁶² Some scholars after extensive research have come to the conclusion that Ophir was the ancient Surparaka and also identified it with the port of Sopara on the west coast, and thus claimed that there was a flourishing trade between South India and the West Asian countries like Egypt and Babylonia.⁶³ That is why a number of Indian items imported into West Asian civilizations came to be called by their Tamil names or their adaptations. The word for peacock in Hebrew, for example, is *tuki* which in Tamil is *tokei*. The location of Ophir is also shown by some on the Makarān coast near the mouth of the *Indus* and there seems to be greater justification to regard it as Solomon’s Ophir.

By virtue of its geographical position, rich natural resources, exuberant flora and fauna, proximity to two ancient civilizations in the west and another a little farther in the east, a centralised efficient administration, and above

all, an adventurous intelligent people well conversant with a number of technologies, the Indus civilization India for many millenniums before the birth of Christ was a hub of maritime activities. Thanks to the Monsoon trade winds which wafted the seas around with a uniform regularity, it was even easier for them to sail over the high seas than only hugging the coast or travel on overland routes. For them, the ocean was not a hindrance but a highway which brought the various peoples together for trade and commerce.

Aryan Culture

The Indus civilization declined, some scholars say, on the ingress of the Aryans from the north-west sometime in 1500 BC or a little earlier. The 'Arya' name was also used by ancient Persian Kings and survives in the word Iran, while Eire—the most westerly land reached by Indo-European peoples in ancient times—is also cognate. The oldest book of the Aryan family of nations is *Rigveda* which is a collection of 1028 hymns composed over a long period by many sage-poets in the praise of various forces of nature deified as gods and goddesses.

There are numerous references to navigational terms and shipping in the *Rigveda* and other Vedic literature. "A few technical names as noted by Macdonnel & Keith (1912) are *nau* (boat), *nāva* (ship), *nāvyā* (navigation stream), *navya* (sailor), *aritra* (oar), *aritri* (oarsman) and *nava-parbharansana* (sliding down of the ship, what we now call launching.)"⁶⁴ Prasad thinks that *nāva* stands for big boats or ships.⁶⁵ A warship was called a *plava* and *pota* and "*dyumna* indicates a flotilla... Perhaps the anchor was known as *naumanda* and *sambina* was perhaps the pole for pushing the boats."⁶⁶ These terms, it may be pointed out, could at best indicate plying of boats on the rivers. But water routes have been

clearly defined into three classifications: *kulyā* through artificial waterways or canal routes, *nādipatha* or riverine routes, and *vāripatha* or sea routes. For river traffic, the *Rigveda* mentions ninety navigable rivers (RV I-121.13).

The sea routes constituted the backbone of international commerce. The occurrence of so many navigational terms in the *Rigveda*, which should be considered 'historically fairly authentic', well establishes the fact that during the days of *Rigveda* the Aryans did know the art of navigation and navigated in sea-going vessels "propelled by one hundred oars and also equipped with wings," i.e. sails (RV X-143.5). A ship is also referred to as *patanga ratha rathavi*, *vi*, *patatri*, *paksi*- literally meaning winged chariot. Likewise, *satāpada* means a vessel with a hundred oars as *satārīta* having a thousand oars.

The Asvins are said to have rescued Bhujya whose ship was wrecked on the sea and brought him to the shore in their hundred-oared boat after voyaging for three days and three nights (RV I-116.4). The following *richa* expresses similar ideas as literally translated by A.C. Das,⁶⁷ lecturer in Ancient Indian History and Culture of the Calcutta University*. The *Rigvedic* hymns (X-136-5 and 6) refer to the western and eastern oceans through which voyages were undertaken for profit. The *Aitereya Brahmana* refers to the sea as bottomless (obviously it could not refer to a river)

अनारम्भणे नदवीरयेथामनास्थाने अग्रभणे समुद्रे ।

यदश्विना अहश्रुर्भुज्युमस्तं शतारित्रां नाव मातास्थिवासम् ॥

* The literal translation of RV I-116.5 is given by A.C. Das which is as follows: "This exploit you achieved, Asvins, in the ocean where there is nothing to give support, nothing to rest upon, nothing to cling to: that you brought Bhujyu, sailing in a hundred-oared ship to his father's house."

and nourisher of land. The *Satapatha Brahmana* talks of *Ratnākar* (the Arabian Sea) and *Mahadadhi* (the Bay of Bengal). The *Atharva Veda Samhita* speaks of vessels riding the waves, faultless in construction, sturdy and spacious.⁶⁸ But they could not have been 'faultless' or 'sturdy' otherwise there would not have been so many prayers pleading with the gods for safe journey. One prayer in the *Atharva Veda* says:⁶⁹

*May Lord Indra and god Pusha protect me
God Aditi and Maruta safeguard us
May rain-preventing God Pārjanya and
seven seas keep us safe
And may the all-pervading God and the
celestial world protect us.
May the noble guardian god Asvin protect us
Likewise, may Usha and Night safeguard us.*

In the face of such overwhelming references to navigation and sea-voyages in the Vedic literature, the views of some western scholars that the Vedic Aryans had no notion about the motion of the ocean or did not go beyond the stage of plying boats on rivers do not merit serious notice. Prof Macdonnel points out that "all references to navigation point only to the crossing of rivers in boats, impelled by oars..." The "natives" in this region, says the learned professor, "speak of the river as the Sea-Sindhu."⁷⁰ Prof Hopkins observes "Some scholars believe that these people (of the Punjab during the Vedic times) had already heard of two oceans (i.e. the Arabian Sea and the Bay of Bengal)... the word for ocean is merely a "confluence of waters, or in general a great oceanic body of water like the air."⁷¹ Such opinions might have been voiced either due to wilful distortion of testimony or sheer "arrogant ignorance." May

be it is a hangover of the colonial era when many European scholars could never give credit, or acknowledge the well-established achievements of the ancient Orient in the field of arts and sciences.

Suffice it to say that there are *mantras* in the *Rigveda* which bring out clear distinction between *Sindhu* the river, and the sea. It is said (VIII-6.4) that all mankind bow before Indra through fear, as the *Sindhu*, i.e., the rivers (or the mouths of the Indus, if you please) do their obeisance to the *Samudra*, i.e., the Ocean.”

In one *mantra*, the *Rigveda* mentions four seas (IX-33.6 समुद्राश्चतुरो / IX-47.2 चतुः समुद्रं). The names of seas as given are *Arvāvat* or the *Pūrva*, *Parāvat* or *Para*, *Sarasvat* and the *Saryanāvat*.⁷² A great Vedic scholar gives extensive details about the environs of each. He also mentions the names of seven rivers, which gave the region they irrigated, the name of *Sapta Sindhu*. These rivers are *Ārjīkīyā*, *Sarasvati*, *Śatadru*, *Parusnī*, *Asikni*, *Vitasta* and *Sindhu*. According to Das, *Sapta Sindhu* was included in what he calls as *Greater Sapta Sindhu* which “extended as far to the northwest as Gandhāra,... and as far to the north as Bactria and eastern Turkestan across the Himalaya.”⁷³ Bhargava gives a more exact boundary of *Sapta Sindhu*.⁷⁴

There is no mention of the eastern regions or of South India in the *Vedas* because these portions were separated from the *Sapta Sindhu* “by a long stretch of sea” extending from east to west. Thus the southern region was an island called the *Jambudvīpa* and the land of the Aryans had seas not only on the east and the west but also along the entire southern stretch. The well-known historian, Wells, publishes a “Probable Outline of Europe and Western Asia”

pertaining to a period about 50,000 years ago (see Map I) in which the entire south portion of India is cut off by a sea from the north.⁷⁵ That makes it highly improbable that a people who were surrounded by extensive seas had never seen one, especially when they had tamed the horse and could easily travel long distances. Nor is it possible that when boats and ships were in common use “some twenty-five or thirty thousand years ago” and ships were seen “on the Mediterranean and Persian Gulf by 7000 BC”⁷⁶ the people of India never thought of making a boat or a ship and venture into the sea almost next door.

To dismiss the maritime activities of the early Aryans under the specious plea that they were metaphysical or moon-gazers is equally fallacious. It completely ignores the chronology of the development of Aryan thought. The *Brahmana granthas* of the various *Vedas* mainly deal with the *Karmakānda* and meticulously lay down the sacrificial rituals to please a particular god for the achievement of a specific material gain-like wealth, victory, celestial weapons, a son or a daughter*. They are often found imploring this god or that to make their voyages safe so that they return with lots of profits. The Vedic merchants invested their capital freely for gain as, an author points out, “they were secured by the so-called insurance corporation.”⁷⁷ Perhaps they had already started forming merchant guilds and taking preliminary precautions not only to make their investment safe but also to reap as much profit on it as possible.

In their enthusiasm to please gods, they took resort to offering sacrifices of animals which naturally generated

* The *Brahmana* portion of the *Vedas* contain directions about the rituals and details connected with each sacrificial rite or *yajna*. It contains etymological details relevant to the interpretation of the *mantras*.

opposition from men of wisdom. That gave rise to serious thinking on the intrinsic value of worldly possessions. The most profound speculation on the ephemeral nature of all that the worldly power and pelf can offer, and the immanence of One Reality, is contained in the *Upanishads* most of which were written around the eighth century BC, in any case before the birth of the Buddha who was well-acquainted with their high philosophy and founded a new religion based on non-violence.

Another Viewpoint

Another point of view is that the Aryans did not come from outside and were the original inhabitants of the *Sapta Sindhu*. This stand is rejected by many scholars. Since history has strange ways of taking unexpected turns and twists, it will not be improper to place the considered opinion of some Vedic scholars on the subject. Their views are often corroborated by several modern scholars and throw a flood of light on the antiquity of Indian shipping. They also bring out similarity of Indian civilization with that of other ancient civilizations like those of Mesopotamia, Chaldea, Egypt, Assyria and so on. At times a piece of information offered by Vedicologists fits in as the missing link in the historical jigsaw puzzle. Who knows the views about certain ancient events held today may undergo revision in the light of later researches.

The thesis of Das is that the Aryan merchants of *Sapta Sindhu*, known as *Panis* or *Vaniks*, were mostly on the move doing business on land and sea. They had therefore acquired a cosmopolitan character and as they did not, or could not, perform the daily Vedic rites, they were not liked by the Aryans. After the deluge, which was mainly caused by the upheaval of the bed of the Rajputana Sea joining the

southern and northern parts of India-the *Panis* started moving southwards and settled on the Malabar and the Coromandel coasts. They spread the Aryan culture, as they knew it, among the Pandya and the Chola tribes. The southern region furnished excellent materials for building ships and the *Panis* specialised in the art of shipbuilding as well as navigation. "These Aryanised Dravidian tribes emigrated to settle in Egypt and Mesopotamia respectively under the guidance of the *Panis*, and laid the foundations of Egyptian and Babylonian civilisations."⁷⁸

Das is so emphatic about his researches that it is difficult to dismiss him as unworthy of any consideration. He says: "I need hardly say that there could be no probability in the case of India but absolute certainty; for it was from the shores of India that *Panis*, the ancestors of Phoenicians, had originally emigrated to the coast of the Persian Gulf, and thence to Syria. The route of navigation to India was perfectly known to them, as it were they who had established it."⁷⁹ Pillai quotes Dr. Hall who says: "the southerners had braved the perils of the sea, and went up to Sumerja; some of them have reached the regions far beyond it..." Dr. Hall maintains "that a Sumerian was very much like a southern Hindu of the Deccan, and it is by no means impossible that the Sumerians were an Indian tribe which passed certainly by land, perhaps also by sea, through Persia to the valley of the two rivers."⁸⁰ The main gods of Egypt, Osiris and his consort Isis, seem to be metamorphosised forms of the Aryan *Isvara* and *Usas**. There is a remarkable similarity between the religious rites of the ancient Egyptian temples and those of modern India+. The *Panis* are known as the

* For details, please see *Rigvedic India* by A.C. Das, pp 194-204

+ On the identity of temple rites in Egypt and India, please see *The Splendour That Was Egypt* by M.A. Murray, pp 144-45.

Punic race in classical literature and later settled down on the eastern coast of the Mediterranean as Phoenicians. They are well-known as sailors, pilots and expert ship-builders.

The Aryanised Cholas and Pandyas when they went over to other parts, carried their myths and mannerism, gods and goddesses, religious rites and social customs alongwith them. Among the legends common in all these civilizations is that of the Great Flood. As the story, with slight local modifications, is prevalent in India, Chaldea, Assyria, and is mentioned in the Bible, it is likely that the event did occur and referred to the great cataclysm when the north and south portions of India were separated by the sea. In Indian version, a celestial fish - perhaps mentioned as *Matsya Avatar* in the *Purānās* - warns Manu - the earliest man - of an impending flood. He is advised to construct “a strong ship with a cable attached; embark in it with the seven *Rishis* (surprisingly, not a single woman is mentioned in the *Matsya Purāna* story) and stow in it, carefully preserved and assorted, all the seeds which have been described of old by Brahmans. When embarked in the ship, look out for me: I shall come recognizable by my horn...”.⁸¹ The Chaldean Deluge Tablet also speaks of the ship into which are stowed ‘the seeds of life of every kind...’ as ‘men have rebelled against me’ spoke God Êâ to his servant. In the story of Genesis VII-IX ‘God looked upon the earth, and behold, it was corrupt’. So he said unto Noah ‘.... I do bring a flood of water upon the earth.... Thou shalt come into the ark...’ So the ship, and consequently navigation, has been etched into what Jung would call the ‘collective unconscious’ of the human race.

With a minor modification, the Celestial Fish of India becomes the divine Fish-man Oannes in Chaldea who came

up in the morning from the Erythrean Sea, instructed the inhabitants of Chaldea, and disappeared under the waves in the evening (see fig 1). Ragozin comments, "The identity between Manu's divine preserver and Êâ, the preserver of Hasisadra, is more than accidentally indicated by the fish guise of the former.." ⁸² She publishes a line drawing of Êâ or Oannes in which the body and face of the fish beautifully merges with that of a well-built bearded man who holds a *kamandal*—carried by Indian *sadhus* even today - in the left hand, and raises the right hand in *abhay mudrâ* granting benediction and safety to his devotees. ⁸³

We are not concerned with who went where first. What is well established is that there were very close contacts amongst the most ancient civilizations in this part of the planet from far longer periods than generally conceded. These contacts were kept by land and sea. On account of India occupying an ideal geographical position surrounded by sea on three sides and helped by the god - given gift of the monsoons, there is every likelihood that Indian Ocean was the birthplace of shipping in the world. When we talk of times, say ten thousand years ago, and more, it is difficult to be sure of what exactly happened. In case of India, the situation becomes intractable for want of any written or dated records. Mesopotamia and Egypt do have some tablets with cuneiform characters but the Indus Valley seals have yet to be deciphered.

Inspite of some dark patches in the earliest period of Indian culture and its contribution to the arts and sciences of the world, in the light of incontrovertible archaeological and other evidences, the achievements of ancient India are getting more and more recognition. Several European and American scholars are now firmly of the view that the

Indians were carrying on maritime commerce since at least 3000 BC. But it takes two to trade and there should be some other peoples who bought from and sold to India. In this regard Indian exports to West Asian and Eastern African regions are generally accepted to be the earliest trading places. There are frequent references to Egyptian and Mesopotamian ships sailing over the Red Sea, the Mediterranean and the Persian Gulf. But the role of the Arabs who were close compatriots of Indians in this commerce has not received proper attention. To have a fairly good idea of Indian shipping, it will be helpful to know something about Indo-Arab co-operation in the area of overseas trade.

Indo-Arab Relations

The Indo-Arab trade relations date back to the dim dawn of human civilization. Of the six ancient civilizations of the world, four flourished in the continent of Asia. In chronological order, the six civilizations are: Mesopotamia or Sumer, Egypt, Indus Valley, China, Mesoamerica and Andes.¹ All other complex cultures have drawn upon the experience and innovations of these ancient peoples. Among the first three, India enjoyed an ideal geographical position and was gifted with good resources. Mesopotamia had the fertile valley of the *Euphrates* and *Tigris* which earlier fell in Persian Gulf with separate mouths. The life-line of Egypt was the *Nile*; the country had Mediterranean in the north and Red Sea on the east. Very early both these seas were joined with a canal. Mesopotamia and Egypt produced enough to meet their requirements, and something to spare and export.

Between these two ancient civilizations, Arabian Peninsula was like a wide wedge and ranked among the poorest countries in the region. Three-fourths of the country is a sprawling sea of sand; beneath it, plenty of 'black gold' has now been found. There are no rivers. It has however a long coastline stretching from the Gulf of Suez in northwest, running for some 1200 miles by the side of the Red Sea in the west, turning southeast along the Arabian Sea and then moving north to the head of the Persian Gulf. Hourani

therefore thinks: "In certain general respects geography favoured the development of sailing from Arabian shores."² But he enumerates a number of disadvantages that Arabia suffered from. One, the vast stretches of desert land on either side of the Red Sea. Two, extensive coral reefs choking that sea. Three, large number of coral islands making piracy a profitable proposition. Four, absence of rivers and lack of good harbours. Five, the country did not produce good timber nor other shipbuilding materials like cordage, cloth, etc. Six, the main products of the hinterland were dates and frankincense in the southern portion, and nothing more worthwhile. Seven, there was no iron producing place nearby. This may not be of much consequence as the Arabian dhows, like the Indian ships, were at that time stitched and not nailed. In the face of such handicaps, the art of sailing could have hardly begun from the Arabian coast and we are inclined to agree with Villiers that Indian Ocean was the birthplace of sailing in the world.

That does not mean that the Arabs were not familiar with navigation. They were mostly sailing to India and the Eastern coast of Africa via the island of Socotra past the Cape of Guardafui. In Africa they could mostly get ostrich feathers, gold and oil. In India, their earliest trade was in beautiful beads, ornaments, cloth, gums, resins, aromatic grasses, ivory, semi-precious stones and some other articles. Very soon, to the list of imports from India, were added ginger, camphor, pepper and several other spices. Arabs had, and still have, a great liking for ginger and very much like the aroma of camphor. Good timber for making ships like teak and black wood was taken from India in large quantities. There were a number of ports on the coasts of Gujarat, Kathiawar and further south, of Malabar where ships could anchor and carry on loading and unloading.

Some of the Kathiawar ports took special care to provide berthing and warehousing facilities.

Rise of Sargon

When the Sumerian and Egyptian civilizations were taking shape, there arose a great Semitic leader, Sargon, in about 2750 BC. Though an “illiterate barbarian,”³ he had acquired such power that he conquered Sumeria and “was master of all the world from the Persian Gulf to the Mediterranean Sea.”⁴ The empire he founded continued for about two hundred years, and again rose from the ashes. After him, the Elamites and then Amorites ruled Sumeria with their capital at Babylon. The great Hammurabi consolidated the Babylonian Empire in 2100 BC. Around the same time, the Semites attacked Egypt and initiated a long line of Pharaohs.⁵

The Semites had maintained equal command over the land and seas since the third millennium BC. They set up a string of harbours on the eastern coast of Mediterranean of which the port-towns of Tyre and Sidon gained great reputation. About 2000 BC they were exploring distant seas in the West. In the days of their glory, they sailed as far as what was later known as the Strait of Gibraltar and settled in Spain and North Africa. According to Wells, “these sea-Semites were Phoenicians” who, some scholars think, were a branch of the Aryan stem called Panis. Alongwith the Chola and Pandya tribes of South India, the Panis, they say, played a prominent role in shaping the cultures of Chaldea (originally Choladesh), Egypt, Assyria and of course Phoenicia. The Semites could never assimilate with Egyptians and were expelled in 1600 BC. But the shipping ventures continued.

There were two good harbours at the head of the Persian Gulf in Apologus and Charax. (See Map II). On the Western coast of the Gulf in north-east Arabia, was the port of Gerrha and the island of al-Bahrayn. Further south was the harbour of Omana and along the southern coast from east to west were Cane, Arabia Eudaemon (Aden) and Ocelis. On the west of Red Sea among the oldest ports were those of Myus Hormus in the north (in Egypt) and Adulis in south (in the country of Axum or Abyssinia). The other ports like those of Alexandria on the Mediterranean, Coptus on the right bank of the *Nile*, and Berenice on the Red Sea came later.

The ancient Arabs used two words for boats - *safina* and *fulk*. The former is from the root *safan* which in Arabic means 'to peel wood with a wedge'; therefore *safin* or *safina* is the 'wood so peeled.' Since *falak* means 'a wave of the sea', *fulk* signifies 'ships'.⁶ As such, from early times, the Arabs differentiated between a boat and a ship. The oldest word for port in Arabic is *marfā* from *rafa* which means to bring (a ship) ashore.⁷

Among the Arab sailors of the Persian Gulf, *nākhuda* for 'a master of the boat' or a captain combines the Hindi word *nāo* and the Persian *khuda* meaning a master. It shows that from ancient times the sailors of India and those of the Arab region were keeping close contacts with each other and they not only exchanged notes on navigation but even evolved common vocabulary.

The Egyptians were quite active in the Red Sea. As early as the Fifth Dynasty we find Sahure (2553-2541 BC) conducting the first maritime expedition by way of Red Sea to an incense-producing land, may be Somaliland, on the African shore. The chief attraction of Egypt in South Arabia

lay in frankincense “which was prized highly for temple use and mummification...” Many expeditions were taken to the Land of Punt to procure myrrh, fragrant gums, resin and aromatic woods.

The location of the Land of Punt is not settled. Some place it on the eastern coast of Africa, others on the coast of Makrān in Sind near the mouth of the *Indus*. The Land of Punt, according to the Deirel Bahri reliefs, “the people know not...”⁸ But one of the inscriptions of early Egyptian Dynasties says that Amon-Re “led the Egyptian army by land and sea, until it came to the Incense Land, and brought back great store of myrrh, ebony and ivory, gold, cinnamon, incense, eye-paint, apes, monkeys, dogs, panther-skins, natives and their children...”⁹ The inscription is of the second millennium BC. Many things mentioned here seem to be of Indian origin. If the Land of Punt refers to some other place than India, then the other possibility is that there was regular maritime trade of that place with India and the merchants took away at least some of these things from India for redistribution. Most of the articles the Egyptian traders were looking for, were found in India, and in plenty.

Hadramawt was known as the celebrated land of frankincense and Zafar was its chief centre whose modern name is Dhufar on the southern coast of Arabia. Frankincense is called *luban* which is very commonly used in India by the same name. In many Indian temples this incense is in regular use. Whatever the case may be, there was some maritime traffic between the ports of Gujarat region on the one side and Egypt and Mesopotamia on the other. Since Arabs were among the firsts to find the behaviour of the Monsoon winds, it seems almost certain that Arab ships were calling on Indian ports from very early times.

We have seen that since the third millennium BC, Semitic people had been sailing on the Mediterranean and the Red Sea. Later, they went far west and explored distant seas. Wells refers to them as “sea-Semites.” Hitti says Arabs “belonged to the maritime type,” who had the advantage of learning their first lessons in the art of navigation on the sheltered seas of the Mediterranean and Red Sea. Compared to open oceans, these seas are rather calm and quiet. Having acquired mastery over such seas, the sailors would have felt sure to venture over the Arabian Sea.

In all probability, the Arabs in the beginning must have hugged the shore and sailed in smaller ships/boats. As they picked up the ways of the winds, later came to be known as Monsoons, they would have found it safer and speedier to ride on those winds over the high seas. That may be one reason that the sea was named after them as the Arabian Sea, and not the Egyptian or Sumerian sea. At that early period of time, the Greeks and Romans were nowhere to be seen or heard of.

When ships were sailing, there should also be ship-building yards. Ships were being constructed in Umān, and at the head of the Gulf of Suez. There is mention of “the shipwrights of Magan” (Umān) in a text from Lagash of about 2050 BC.¹⁰ The Egyptian texts refer to the vessels constructed at the Suez with the help of Phoenicians as the “ships of Gebāl”, the city which also supplied pine wood and resin required for building ships. Ships were also built at Ezion-geber on the Red Sea.¹¹ Hourani points out that “Arab merchant ships from Muza and Cane were conducting a regular commerce with Barygaza.”¹² Although *Periplus* was well aware of many ports on the western and eastern coasts of India, the book does not talk of Arab sailings beyond

Barygaza. Hourani however thinks it "very probable" that they had been sailing to Malabar "for centuries" to fetch the timber for making ships. According to *Encyclopaedia Britannica* (eleventh edition) teak is "the most valuable of all known timbers" especially for building ships.

For the well-established civilizations of Mesopotamia and Egypt, which had almost all the necessities of life, shipping could have been of secondary importance - only to hunt for curiosities and luxuries. The Arabian Peninsula, on the other hand, had meagre natural resources. As Wells has pointed out, the ancient Semites had to survive "as traders and as raiders."¹³ India was well-known in the then world as a rich country abounding not only in articles of luxury but in many others required for daily use. Therefore for the Arabs, apart from sailing on the Red Sea and the Persian Gulf, it was necessary to look towards India to buy goods, and sell them elsewhere. From the very early times they tried to act as intermediaries in trade and commerce. There are reasons to believe that they had been jealously guarding the source of the merchandise they sold, as also the secret of the Monsoons, as long as they could. India had good ports and from the very beginning the Hindus and Arabs had very cordial relations.

While the Phoenicians left their homes on the Persian Gulf and settled on the eastern shore of the Mediterranean to win the commerce of the West, the Arabs "continued in control of the carrying trade of the East, subject to their agreements and alliances with the merchants of India."¹⁴ They took cotton cloth, precious stones, timber, spices and many other items from India, sometimes in their own vessels but "largely by Indian vessels",¹⁵ redistributed them at the island of Socotra, which was a cosmopolitan market, and

carried them to the *Nile* and the Mediterranean. "Gerrha and Obollah, Palmyra and Petra, Sabbatha and Mariaba were all partners in this commercial system."¹⁶

The Arabian ships reached India by three routes: they could sail to Barbaricum at the mouth of *Indus*, or to Barygaza (modern Broach) on *Narmada*, and to Tyndis and then to Muziris on the west coast of Kerala. Once the goods were brought to the Red Sea and the Persian Gulf, these were distributed over the age-old camel-caravan routes. One caravan route ran from Zeugma (Birejik) between the *Tigris* and *Euphrates* eastward to Babylon and Seleucia. But due to heavy tolls levied by the local Shaikhs, it was generally avoided.

According to Strabo, one route started from Yemen and went to Damascus via Petra. From Petra caravans went west to Rhinocolura, northwest to Gaza and north to Jerico. The people of Gerrha sent goods by raft up the Persian Gulf and the *Euphrates*, and also by caravans to Yemen. The famous overland route with the "Silk Road" which combined with ancient "Kings Way" of the Archaemenids starting from Baghdad passing through Persia, Transoxiana and entering Tarim Basin going as far east as the Turfan Oasis. On the way, it passed through several mountain passes.

The Arabs used all the energy and subtlety and every imaginable ingenuity so that the people of Egypt and other countries should not get the vaguest guess about the sources of the products they demanded, or the sea routes that led to those sources in India and Abyssinia, nor did the Egyptians make any attempt to know about them. The trade came and the price was paid. The secret was so well guarded that later when the Greeks and Romans appeared on the scene, they

“evidently presumed that all the commodities in which the Arabians dealt were native products of their own land...”

The Arabs were a peace-loving people, only intent on trade. The Hindus gave them land in the suburbs of many towns. The Arabs settled down mostly on the Konkan and the Malabar coasts much before the advent of Islam. Many of them married local women and their progeny is known in Kerala as the Mopalahs. This turned mere trade contacts to blood relationship. It was not a one-way traffic. Many Hindus had travelled to Arabia in pre-Islamic period, some alongwith their women and permanently settled there. Arab historians have classified them in five categories: *Zut*, *Meid*, *Siyābajab*, *Ahmariya* and *Aswirah*. It shows that the Indians had migrated in large numbers. The *Zats* migrated in ancient times and were perhaps the “Jats of modern Haryana region who had joined the Persian army in the sixth century BC as mercenaries and later settled in the coastal areas of Basrah and al-Bahrayn.”¹⁷

In the post-Islamic period during the days of the Fourth Caliph, Ali (656-661AD), they were appointed in charge of the Muslim treasury at the time of the famous battle of Jabal. The *Meids* had also joined the Persian army about the same time and subsequently settled in Arabia and were employed as guards of Arabian ships and boats. They were perhaps originally pirates who roamed over Indian seas and were therefore considered most suitable to take care of the ships against piracy. In addition the Arab ships laden with merchandise were looked after by *Siabaja* as an auxiliary force. *Lisān al-Arab* describes them as “strong and brave.”

These Indians have been praised in Arabic poetry as “dependable protectors.” Siddiqi quotes Abidi who says, “It was due to the strong protection from these people that

the Arabs successfully carried their maritime trade and occupied a place in the history of middle ages.”¹⁸ *Ahmara*, “the red-clad people from Sind,” according to *Tārīkh-i-Tabarī* were renowned commentators on religious philosophy, particularly Buddhism, during the days of First Caliph Abu Baker (632-34 AD). The *Aswiras*- Sanskrit *Asvavāra* i.e. cavalrymen—who had held high positions in the Persian army, were the most influential among the Indian settlers.

Successive Invasions

The Indians were going to Persia and Arabia in ancient times through the north-western passes. But when the son of Darius I, Xerxes, raised one of the largest armies to attack Greece in 480 BC—they might have migrated to join his army as mercenaries in large numbers. After the war, many of them after making a fortune, settled in various Arabian cities like Yamana, Najran, Mecca and Medina. The Persians were the first to disturb the palmy days of the Semitic lands. Then came the Greeks who successfully supplanted the Persians. The untimely death of Alexander the Great led to the breakdown of his empire and encouraged the Romans to fish in troubled waters. Perhaps none considered it worthwhile to march over the forbidding land of surging sand of Arabia.

Most of this trouble was perpetrated by the invaders mainly to control trade routes on land and sea. The Arabs fell, as it were, under the ‘power-shadow’ zone and continued to carry on their business. They had been working in close co-operation with Hindu merchants and in the face of foreign competition, their business bonds became stronger. When the Greeks overran Persia, many Persians sought shelter in India and have ever since contributed to the prosperity of their adopted land. Similarly, when the

Romans, later destroyed the holy temples of Israelites, they came to south India and have since permanently settled there.

The induction of foreign elements in the region was not without its beneficial fallout. It opened up new trade routes on land and water. It expanded the markets for Indian merchandise. At times it was not possible for Indian and Arab merchants to meet the growing demand of European nations. This is often cited as one of the reasons for Indian merchants to go east to procure spices and other merchandise. All this pepped up shipping.

Once the secret of the Monsoon winds was known to others, Roman ships started calling directly on Indian ports, first on the western coast and then on the eastern. The Arabs did lose much of their monopoly but they also tried to explore new seas following in the footsteps of the Hindu merchants with whom they continued to keep close contacts. They sailed east as far as Canton in China and set up a factory there in the fourth century AD. There was what we will call today a 'globalisation' of the market and competition, though not cut-throat. The people sincerely believed in live and let live and worked for mutual prosperity.

Persian Attack

King Cyrus, the Persian ruler of the Median Empire started the process of dismembering the Semitic kingdoms. He attacked many countries and when he reached Babylon, the gates of this ancient city were opened to him in 538 BC and he walked in without any fighting. At its zenith, the Persian Empire of Darius I (521-485 BC) included all Asia Minor and Syria, all the old Assyrian and Babylonian empires, Egypt, the Caucasus and Caspian regions, Media,

Persia, and extended into India as far as Indus. Herodotus says that the satrapy of India “furnished the heaviest tribute” to the Persian Empire. Arabia was left out of the Persian Empire as, according to Herodotus, the Arabs had promised to pay a tribute of one thousand talents of frankincense to Darius which was much in use in the Persian temples.

Darius appreciated the importance of linking Persia with India and Egypt. He sent a fleet down the Indus and thence around Arabia to Egypt. At his command, a Greek named Scylax “is said to have travelled in India, and to have navigated the *Indus* in 509 BC.” He also had a ship canal dug from an arm of the *Nile* near Zaqāzīq, down the Wadi Tūmilāt, and through the lake to Suez. He carried out an experiment by sending a fleet from the *Nile* down this canal and the Red Sea to Persia.

India had maintained links with West Asia even before the rule of the Archaemenids. The Persians had built long arterial roads to keep in touch with their extensive empire and also to control trade and commerce. Panini refers to the *Uttarāpatha*, the Oxus-Ganga road, which was connected with a network of Persian roads. The sea played an equally important role to connect with the West. Mrs. Rhys Davids writes: “The early commerce between India and Babylon was largely via the Persian Gulf.” Rome and Egypt were linked with India through the Red Sea. How extensive was the direct traffic, it is difficult to say as for a very long time the trade was routed through the Arabs. Even in the West Asian region, trade continued to remain mostly in Semitic hands and their ships freely plied from the Mediterranean ports. Arab trade with India went on as before.

Rise of Greece

The rising power of Persia was an eyesore to many nations. In northern Greece, King Philip of Macedonia

dreamt of conquering Asia and started reorganising his army in 359 BC. His strategy was to have a close-fighting cavalry and a hurricane charge of horse-driven chariots. He united many island republics of Greece and untiringly worked for twenty years to raise a formidable force. In 339 BC, a congress of all Greek states was held which appointed Philip as the captain-general of a Graeco-Macedonian army. His army advanced like a sea wave and entered Asian soil in 334 BC. His son Alexander, a hobbledehoy of eighteen years, was by his side. Meanwhile, Philip had taken a second wife which generated such jealousy in the heart of his wedded wife that she got him assassinated, and a promising career was cut short. But it did not change the course of history.

Alexander, who had received training under masters like Aristotle, took up the unfinished task of his father. He mustered his army and in 332 BC entered Egypt, marched upon Babylon, met Darius III near Nineveh, pursued him when he fled north, but found him dead. His own people had killed Darius perhaps for earning the ignominy of fleeing from a battlefield - an anathema to Aryans. Alexander completely subjugated the entire Persian Empire, went to the farthest boundary and that is how he came to the last Persian province on the bank of *Indus* from where he returned. It is said that Alexander cut huge trees from Emodoi mountains for building a fleet with which he crossed the Hydaspes to reach the country of Porus.¹⁹ His people, it is said, were “intimidated” by the accounts they heard about the great power of the Indian king of Prasioi (Sanskrit-Pracyas, meaning easterners). His admiral Nearchus’s fleet sailed down the *Indus* into the sea and to the Persian Gulf. He set up satrapies in charge of his trusted generals and literally brought about a marriage between the Occident and the

Orient by arranging mass marriage of his officers at Susa with Persian and Babylonian women.

When in India, he made it a point to learn about the country as much as possible and to meet the Indian men of wisdom. As the story goes, in one village he was offered breads of gold. On enquiring if the people there ate gold, he got the retort that he had no paucity of eating bread in his own country but it was his greed for gold which had dragged him off so far and caused so much bloodshed all along the route. He left India deeply impressed by its wealth and wisdom, and as a friend. Among the precious presents given to him were a few pounds of Indian steel which proves the excellent quality of steel produced in the country at that time.

Alexander's interest in developing Greek shipping is borne by the fact that from Egypt, he despatched an expedition to sail round Arabia which returned after reaching Bābal-Mandab. He founded the city of Alexandria at an excellent location near the crossroads of Asia and Africa. This city stimulated commerce to a size unknown before and energised the economics of India and Arabia. "The first to undertake the journey from Alexandria to India was Eudoxus of Cyzicus at the end of the second century BC, bringing with him an Indian pilot found on the Egyptian coast."²⁰

At the height of his glory, Alexander passed away in 323 BC. The political significance of Alexander's conquests was minimal but the commercial consequences were of great importance. For the first time, the people of India came into direct contact on an extensive scale with a dynamic and comparatively younger European power. It had a far reaching impact on trade and commerce of the two peoples. The

Arabs and the Jews now no longer retained exclusive control over Indian trade. Shipping received a fresh impetus.

Much before the so called discovery of the Monsoons by the pilot Hippalus in 45 AD, these seasonal winds had been known to the Greeks since the return of Nearchus from the *Indus* (326 - 325 BC) according to Hourani.²¹ Hippalus was able to use the southwest monsoon only on the outward voyage to India. The Arabian Sea was turned into a highway and was far more frequented by the ships of other countries. The Greeks opened a window for Indian merchandise which found its way to many more peoples. There were then no advertising companies but the word of mouth did the trick which spread like wild fire.

When one of Alexander's best generals, Seleucus, wanted to repeat the success of his Macedonian master in 305 BC and attacked India, he had to accept a humiliating defeat at the hands of Chandragupta Maurya. In terms of peace, the Greek general, bearing the title of Nikator or victorious, had to give his daughter as a gift and cede the provinces west of *Indus* up to Kabul. He sent Megasthenese as his ambassador who stayed at the Mauryan court for several years and on return gave gushing account of the glory that was India.

Ptolemy II exchanged ambassadors with Mauryan emperors, Chandragupta and Asoka. An official of Ptolemy VII was "in charge of the sailings" says an inscription of 130 BC. Between 120 and 110 BC, a number of direct expeditions by sea to India were led by Eudoxus. From then on there were regular sailings to India and the Egyptian kings exercised supervision over them. Four dedicatory inscriptions dated between 110 and 51 BC have been found

in Egypt mentioning that Ptolemaic officers were in charge of the Red Sea.

The Mauryas

For the first time under the Mauryans, emerged the total personality of India. In the west, Chandragupta extended the borders of the country beyond the traditional boundaries and absorbed in his empire a major portion of modern Afghanistan. His son Bindusāra (known to Greeks as Amitrochates, from *amritraghata*, the destroyer of foes) campaigned in the Deccan and took the Mauryan empire as far south as Mysore. At his death in 272 BC, practically the entire sub-continent had come under the Mauryan suzerainty. The extreme south accepted his authority and there was no need for military conquest. Only Kalinga in the east defied the Mauryans and that task was completed by his son Asoka the Great.

There was throughout the country a central authority which was well recognised and respected. Administration was efficient and responsive. Communication system in the length and breadth of the empire, supplemented by a superb spy system, was highly dependable. All important cities were connected with a network of roads. The ports had direct links with industrial centres in the hinterland. The Great Royal Highway, precursor of the Grand Trunk Road, was one of the wonders of the world. It ran from the north-west frontier of the Empire to Taxila, crossed the rivers of the Punjab, reached Prayāg via Kanauj, went to Pātaliputra and from there to the mouth of the *Ganga* joining the Bay of Bengal.

Agriculture dominated but industrial development received special attention. The revenue from tolls, customs

etc. formed the main sources of the imperial treasury. The dues from the farmers and the factory owners were fixed but were kept flexible depending upon the yield from the farms and profits from production. The business class was well organised. Some important and strategic industries were run by the State, i.e. in modern parlance, there was even then a public sector. Every major craft had constituted a guild so that they could command better bargaining power from the authorities and also compete effectively with local and foreign merchants. There were guilds of potters, metal-workers, carpenters, goldsmiths and many other manufacturers.

An idea of their prosperity and power can be had from the fact that one wealthy potter named Sadalaputta had owned as many as five hundred potter's workshops.²² He had organised his own distribution and owned a large number of boats which took his pottery from workshops to various ports on the *Ganga*. Bigger businessmen owned ships in which they carried their merchandise to distant lands to earn profits. The guilds enjoyed royal favour but we are not aware if the King had financed and directly protected overseas trade and commerce. Most of it was probably conducted on personal initiative and risk.

Among themselves, the members of each guild had close understanding on matters of financial transactions and their customary usage had the force of law. Each guild had its own emblem and insignia carried with all pomp and show on festive occasions. The Bhita excavations have brought to light numerous seals belonging to these guilds²³ or corporations as we would call them today. Most of the guilds and their members were very wealthy and donated huge amounts to monasteries and temples.

The merchant class had likewise a good working arrangement with their foreign counterparts - Arabs, Greeks, Romans and others. The businessmen formed the backbone of national economy. When empires disintegrated and petty kingdoms sprang up in their place, it was this community which ran like a thread through the multiple power centres and kept the country together. Their job was to buy and sell, wherever they could get a better price, and make a profit.

One of the objectives of the rulers in power was to control trade routes and demand a share in that profit. Whether it was Persia, Greece or Rome, the aim of each was the same. But so far as they were not very avaricious and did not extort, business went on for everybody's good. At times, an exorbitant duty charged had to be reduced later. The Romans levied 25 per cent duty on all incoming goods during the first century AD, but had to cut it down to half later.²⁴

The Roman Invasion

Soon after the meteoric career of Alexander came to an abrupt end, his vast empire crumbled and was divided among his generals. Division is always weakening and history hates a vacuum. If the Greeks had provided a window to India, the Romans opened the floodgates of maritime trade. With the discovery of Monsoon winds by Hippalus, Roman ships started sailing directly to the west coast of India and then crossed over to the eastern coast. There were several routes to the East. First, Verlinden thinks, Roman ships left from Cape Syagrus on the southern coast of Arabia, took on the westerly wind and reached Patali near the mouth of the *Indus*. Second, from the same Cape, the sailor ventured to the middle of Indian coast. Third, one left from Ocelis near the Strait of Bab-al-Mandab and rode on Monsoon to

Muziris in southern India. The fact that these itineraries were established because of the wind whose name is originally Indian, suffices to prove that “the ships were first guided by Indian pilots, as it happened in the case of Eudoxus, and later of Vasco da Gama who had the services of a Gujarati.”²⁵

At that time Barygaza to the westners, ancient Bhṛgukachcha (modern Broach) was a very important port on the Gujarat coast. The *Jatakas* mention it as an important port-town (*pattanagāma*). Overland routes from north and south touched this port. Commodities brought from the hinterland were loaded from this port in large vessels. Similarly, foreign merchandise brought from overseas was unloaded here and distribution arranged for interior markets.

Beyond Barygaza as one sailed southwards, there was a chain of ports which included Sūrpāraka (Sopara), Calliena (Kālyan), Semylla (Chaul), Mandagora (Bankot), Palaepatamae (Dabhol), Melizigara (Rajapur), Aegidii (Goa), Naura (Cannanore), Tyndis (Ponnani), Muziris (Cranganore), Nelcynda (near Kottayam), Comar (Kanya Kumari), Colchi (Korkei, noted for pearls), Camara (Kaveripattanam), Poduca (Arikamedu), Nikam (Nagapattinam) and Masalia (Masulipatanam).

The trade expanded enormously and fresh items were added from time to time. When Rome ruled Egypt, they controlled all the caravan-routes previously won in Asia Minor and Syria. The direct sea-route to the East was used by way of the Ptolemy's outposts on the Red Sea. The successive conquests of the Mediterranean peoples had brought unprecedented treasures to Rome which they were able to spend to buy all the exotic and tantalizingly tasty items of the Orient. India was the main producer of these

articles and profited enormously with the Roman trade. Ships from the Red Sea ports sailed direct to Muziris on the western coast. The most important items of export from there were pepper and pearls. Other articles from India included silk, fine textiles, saffron, spikenard, malabathrum, semi-precious stones and sapphires. Imports constituted copper, coral, topaz, antimony, crude glass, tin, lead, realgar, orpiment, a little wine and wheat.

On the eastern coast, Camara of *Periplus*, ancient Puhār and later Kaveripattanam, and Poduca or Arikamedu were important port-towns. *Sangam* works like *Silappadhikaram* and *Manimekhalai* glorify these and other Tamil ports. Both the towns had certain areas earmarked for the residence of *Yavanas*—the term earlier meant only the Greeks and later was applied to all foreigners who freely mixed with the local people. The ships entered Kaveripattinam port, says an account, without slackening the sails and their precious cargo was stacked along the beach. Another work says that in the harbour “high-masted ships with fluttering flags swayed like the elephants fretting and fuming and rubbing against the posts to which they are tied.”²⁶

Arikamedu Excavations

Excavations carried out at various sites in these port towns have brought to light massive port structures and connected buildings like warehouses. At Arikamedu, near Pondicherry, the 1945 excavations prove extensive Roman contacts. Among the artefacts are “two gems-carved *intaglios* datable to the first century BC/AD; two handled amphorae; Mediterranean wine jars; Arretine Wares, belonging to the class *terra sigillata* and of indubitable Roman origin, and Rouletted wares, also of Roman origin; and Roman lamp.”²⁷ Hoards of Roman coins have been found not

only at these ports but also at several sites into the interior. The balance of trade was certainly in favour of India and Roman leaders were worried about the outgo of their gold to India.

According to Pliny, the subject of drain of Roman treasury to buy oriental luxuries “is one well worthy of our notice seeing that in no year does India drain us of less than 550 million sesterces (\$22 million) giving back her own wares, which are sold among us at fully 100 times their first cost.”²⁸ Since the minimum property qualification for a senator was a million sesterces, “these are not astronomical figures that Pliny had worried about.”²⁹

While Romans traded with Indian ports on the western and eastern coasts, Indian trade with West Asian countries also gained momentum. In the pre-Islamic days, about the first century AD, the list of exports from India was far larger than imports and included live animals and birds as curiosities, furs and hides, Kashmiri wool, musk, mother of pearls, precious and semi-precious stones, lac (red dye), a little ivory and most important of all, silk. Among vegetable products, pepper was the most important followed by ginger, cardamom, cinnamon, cloves, spikenard, nutmegs, indigo and cotton.

Among precious wood, ebony, rosewood, sandalwood were most prominent. Many of the items were valuable luxury articles which carried high tariffs and heavy transport charges. Much went direct by sea from Aden to Malabar coast or Ceylon, and vice-versa, and some was brought to Gerrah or Spasinou Charax. From there it was transported through caravan routes. The details of caravan trade are available from the Palmyrene inscriptions which are mostly of the second and the first half of the third century AD.

Emperor Augustus limited the Roman dominion to the bank of the *Euphrates* and the trade paid its tolls to the Empire of Parthia and to the Arab kingdoms until Rome could develop and control a sea-borne trade to India. To this list of imports *Periplus* adds "Indian iron and steel, and Indian cloth" from the district of 'Ariaca' (the modern Kutch, Kathiawar in Gujarat); the broad cloth called *monache* "singularly fine" says Vincent and that called *sagmatogênê* ("the sort used for stuffing"), and girdles, and coats of skin and mellow-coloured cloth, and a few muslins, and colored lac."³⁰

The exports from Babylon were not many. Persia exported asafoetida, precious and semi-precious stones and dates. The products from Yemen and Hadramawt included incense, myrrh, Balsam and nard, mostly to Rome and none to India. "When a Apollonius of Tyana arrived at Zeugma after his eastern journeys..." and was asked what he had to declare, he replied: "Temperance, Virtue, Justice, Chastity, Fortitude and Industry,". The Customs Officer retorted: "Where are the girls?"³¹

The Roman exports to West Asia were rather limited and included "Yemen textiles of various kinds (mostly Egyptian and Syrian linen), purple stuffs (from Tyre), belts, glass ware (probably Alexandrian or Sidonion), tin, iron, saffron and a little wine (Laodicean or Italian); also for the king, horses, mules, gold and silver plate, bronzes and high-grade clothing."³² Of these, items like saffron and fine textiles must be of Indian origin. Romans had a Minister for Trade in the Orient and Egypt (*comes commerciorum per Orientem et Aegyptum*), who controlled the frontier from Taurus southward. Under him, as suggested by a fifth century inscription, there were two *commercarii*, one for

Mesopotamia and the other for Palestine and Clysima (Suez).³³ By then an understanding had been reached between Rome and Persia about the routes through which the trade shall pass and the proportion of duties and toll-money that will be shared.

On the eastern coast of Africa, Indians and Arabs both were active and worked in close co-operation with each other through "agreements and alliances." There are reasons to believe that Buddhist influence had reached in Abyssinia through the monks and missionaries. Noting a great monolith at Axum, James Fergusson is of the view that it is of Buddhist origin—"the idea Egyptian, but the details Indian."³⁴

Schoff in his annotation on *Periplus* publishes a photograph which shows several monoliths at Axum. Later, the region had been under Arab control from time to time. Both traded in gold, ivory, oil and ostrich feathers. The cloth and precious stones, spices and timbers were "brought from India largely by Indian vessels," redistributed at Socotra or Guardafui and carried to the *Nile* or Mediterranean. "Indian navy is recorded to have visited Ubla (Obollah) near Basra known those days as the Gateway of India."³⁵ Indians had their permanent representatives in several cities.

About ninety miles north of Opone is the Cape Guardafui or the 'Horn of Africa' known to the Romans as *regio aromatifera* as it exported large quantities of myrrh. But Drake-Brockman says that he had "not come across any trees of the cinnamon group, nor have I heard of their existence." Schoff remarks: "If there was any aromatic bark produced near Cape Guardafui and not merely transshipped there, it seems almost certain that it was an adulterant added there to the true cinnamon, that came from India."³⁶ It is quite

likely that the aromatic bark from India along with other merchandise first came to the island of Socotra and from there taken to the Horn of Africa almost next door. Socotra, meaning "Island abode of bliss" was the meeting place of many nations and carried on a flourishing exchange trade. It had acquired a cosmopolitan character with Indians, Arabs, Greeks, and probably Persians and Africans mingling in its markets.

About half-way between Makrān and Socotra, Marco Polo speaks of two islands "called Male and Female, lying about thirty miles distant from one another,"³⁷ each inhabited exclusively by men and women. The men visited the other island for three months starting in March, then they returned to their own island. This shows that the ceremonial value of the incense depended on the personal purity of the gatherer who should not undergo pollution through the presence of a woman or of the dead. The 'pure' incense gathered by unpolluted persons was considered by belief as the "most effective vehicle of prayer...". Trade in certain articles depended upon the social significance and utility of those goods among particular countries and specific communities in a particular period.

Legends and beliefs attached to these commodities enhanced their value and increased their demand. The job of the traders was to meet that demand and take full advantage of the people's faith. It is not unlikely that some clever merchants might have 'created' some myths or impressive stories around their products which might appeal to the gullible minds, and reap higher profits. In addition to the intrinsic utility of a commodity, it has also to fulfil a social purpose. From Socotra seems to have been derived the name of a Sea-goddess in Gujarat called *Sikotarimata*. That confirms very close connection between the Gujarat

ports and the island of Socotra. There are temples, dedicated to this goddess at Kuda near Gogha, at Mithli near Cambay, and at Hajira near Surat.³⁸

With the decline of Babylonian and Egyptian civilizations, Indo-Arab relations received great impetus and Arabia served as a highway of trade between India and the Hellenistic world. During the reign of the Imperial Guptas, since industrial development had reached a high state, more manufactured items were added to exports in addition to the usual articles like ivory, jewels, teak, cane, bamboo, camels, Sindhi fowls, velvet, cotton textiles, musk, sandalwood, and a variety of spices and medicines. The growing trade and commerce with India and China immensely enriched the Arabs who started developing economic and cultural institutions in their old city.

The understanding between the Indians and Arabs is well illustrated by their trade in cinnamon (*dalchini*) with the foreigners. This product, the aromatic bark of a tree native to India—was familiar to both, the Greeks and the Romans. It was used as an incense and as flavour in oils and salves. The plant has a place in history almost at par with kings and queens. It is mentioned by Hippocrates, Theophrastus, Pliny, and Dioscorides. The last writer says, it “grows in Arabia; the best sort is red, of a fine colour almost like a coral; straight, long, and pipy, and it bites on the palate with a slight sensation of heat.”³⁹ But Schoff says, it is “native in India, Tibet, Burma and China.”⁴⁰ Marco Polo describes it as growing in Malabar, Ceylon and Tibet.

There is also another flower-tip bark and wood called cassia which is very similar to cinnamon. The difference between the value of the two is enormous—a pound of

cinnamon will cost as much as 1500 denarii (about \$ 325) as against 50 denarii of cassia.⁴¹ It is difficult to distinguish between the two and cassia is quite common growing at many places. According to Pliny, Troglodytes brought it “over vast tracts of sea” to Ocelis port on the south-western tip of Arabia. It is quite probable that cinnamon grew at many places, but not in Arabia, where it was brought mostly from India rather than from Tibet, Ceylon or China, as India was the nearest of them all. In Arabia, or in Axum, the source was kept a well-guarded secret.

The Romans bought cinnamon—as many other products--from the Arabs and always believed, it was grown in Somaliland, a tributary of Arabia. The cinnamon leaf, which they knew under the name of *malabathrum*, is produced in India and Tibet. An Indian merchant would never sell cinnamon bark to any Roman merchant. Similarly, the cinnamon leaf would not be sold to a foreigner by the Arabs.

Schoff remarks in his introduction to *Periplus* “...so strong was the age-old understanding between Arab and Hindu, that cinnamon, which had made the fortune of traders in Egypt in earlier times, was still found by the Romans only at Guardafui and was scrupulously kept from their knowledge in the market of India, where it was gathered and distributed; while the leaf of the same tree producing that precious bark was freely offered to the Roman merchants throughout the Malabar coast, and as *malabathrum* formed the basis of one of their most valued ointments.”⁴² It is not to deny that there was a business competition between the Indians and the Arabs--and the latter did not like the presence of Indians in the African trade--but whenever arose the question of dealing with a foreign merchant, they always worked in tandem with each other.

The Arabs were the first foreigners to establish business contacts with India by sea. They were also the earliest people to permanently settle down here. It was therefore natural that a special relationship developed between the Hindus and Arabs over the centuries. By the first century AD, the ships of many countries—Persians, Greeks, Romans and of course Arabs—were calling on Indian ports on the western and eastern coasts. Some scholars think that the Indian merchants were not able to meet the rising demand of Romans and other foreigners for Indian goods. Therefore they looked for fresh sources of spices and other commodities in Southeast Asian countries.

Some others are of view that the pressure of Imperial Guptas upon the Scythian invaders compelled a branch of Indianised Kushans, settled on the banks of lower *Ganga*, to seek their fortune beyond the Bay of Bengal in the Southeast. Since the Indian market was well-saturated, it is also likely that adventurous Indians with dash and initiative, who had heard legends about the Land of Gold, set sail to unknown seas to explore new lands. Whatever the reasons, Indian ships in large number ventured into the seas of Southeast Asia in the first century AD, and in some cases much earlier.

The Glorious Era

The Mauryans made multilateral contribution to the all-round development of India. In external relations the country commanded respect in the comity of nations. It found admirable mention in such standard works as Strabo's *Geography*, Arrian's *Indika*, Pliny's *Natural History*, Ptolemy's *Geography* and the *Periplus Maris Erythraeae*. The borders were well guarded and peace and prosperity reigned throughout the country. At the back of this success story was Kautilya - also known as Chānakya-the Prime Minister, who had picked up young Chandragupta, and moulded him into a monarch of a vast empire. Fortunately, Kautilya has recorded his philosophy and views in *Arthasāstra* which contains many ideas which may be of help even to modern politicians. His treatise goes from the most sublime to the most mundane matters of statecraft. Based on the ancient *danda niti*, it is a model for conducting the most efficient and energetic administration. What is of interest to us is that among other departments, he organised port management and shipping industry in great details.

Trade and Commerce

Kautilya was the teacher of Chandragupta Maurya who laid the foundation of the Mauryan Empire. Under Asoka "the arms of Mauryas were carried almost to the southern

extremity of the Indian peninsula and the Mauryan banner wafted across the vast stretch of land from Herāt in the northwest to Madura in the south". That completed the Aryanization of South India where a number of kingdoms like those of Cholas, Cheras and Pandyas had come up. The predominantly agrarian economy was diversified. Industrial development was encouraged. Some of the artisans like armourers and shipbuilders directly employed by the state were exempted from taxes. Others worked through various guilds for each major industry.

Mahāvastu has preserved lists of 24 guilds, 22 heads of guilds and 30 professions representing a flourishing world of trade. These guilds enjoyed great advantage in dealing with the government and obtaining a number of legitimate facilities. Some traders were named after the articles in which they dealt or on the basis of the countries visited by them. Thus there were *Aswa Vānija*, *Gandhāra Vānija*, *Kashmir Vānija* and *Madra Vānija*.¹ Their indomitable courage in trading with distant lands gave birth to the dictum of the poet Bāna, "To them, the earth appeared as a platform in the courtyard, and the sea as a mere channel".²

The traders knew from tradition that "money makes money" (*Atharva Veda* III-15.6). According to Kautilya, *artha* stands for all the natural resources wrapped in the golden skirt of soil. The government fixed a toll, one-fifth of the value of the article, in addition to a trade tax which was one-fifth of the toll. A tax was levied on all manufactured articles, and the date of production stamped. A highly efficient system of collecting and transmitting information was in vogue when even a daily newspaper was conspicuous by its absence.

Extensive opportunities were provided for the development of trade and commerce within the country and over-

seas. The merchant class enjoyed a respectable status and it may be stated without fear of contradiction that in later periods of political uncertainty, it was this class which continued to provide strength to Indian economy. During the days of Mauryas, shipping received great impetus so much so that it became necessary to regulate it properly. It is perhaps for the first time that Kautilya's *Arthasāstra*, apart from offering gems of political thought, institutionalised the system of trade, commerce, transport and navigation. The treatise goes into great details in describing port administration and duties of the crew. No other nation, as far as we know, had earlier attempted to offer such superb management system.

The Naval Department was under the overall charge of a *Navadhyaksha* or the Controller of Shipping. He took policy decisions and laid down detailed procedures to be followed by the industry. The *Pattanadhyaksha* was the equivalent of the present-day Chairman of the Port Trust. He regulated the entry and departure of ships, allotment of berths, provision of warehousing facilities and proper maintenance of ships. The damaged ships were repaired and the unserviceable ones discarded.

The crew fell under three main categories: *Shāsaka* (captain), *Niyāmaka* (steerman or pilot) and *Datrarasmigrahaka* (manipulator), i.e. one who looked after rigging and bringing down the sails. There was also a *Utsechaka* who bailed out the seepage water and kept the ship dry. The *Arthasāstra* also mentions the post of *Mahasāratha*, i.e. leader of the fleet indicating that often a large number of ships used to move together as if on an expedition.

Smith remarks, "The existence of these elaborate regulations is conclusive proof that the Mauryan empire in the fourth and third centuries BC was in constant intercourse with foreign states, and that large number of strangers visited the capital on business."³ No model of a ship of that period is to be found. An idea of such craft could be had from reproductions of some vessels in art works like reliefs at Sānchi and Bharhut Stūpas.

The systematic organisation of the Department of Navigation shows that Indian shipping was then very vigorous. The Mauryans gave great importance to means of communication and transport. They built a Royal Highway from Taxila to Pātaliputra which survives today as the Grand Trunk Road.⁴ There was a network of roads connecting ports on the western and eastern coasts with industrial centres in the hinterland. The most widely-used highway westwards was from Taxila to Kabul from where roads branched off in various directions.

A distinction was made between riverine navigation and that of sea. Navigation by river was considered better and more economical than by road. The advent of the Greeks and the Romans in Indian waters opened up enormous opportunities to Indian traders. Their voyages to the western, eastern and southern destinations received unprecedented impetus. The emergence of small kingdoms in South India attracted Indian seamen from the north, west and east as well as the Romans. A chain of ports was established all over.

After the assassination of the last Mauryan emperor by his commander-in-chief, Pushyamitra, various centres of power sprang up and there was no central authority. In the east Khāravela came to the throne of Kalinga in 183 BC, the

year when Mauryan emperor Brihadratha was murdered. He invaded Magadha, captured Pātaliputra in 171 BC, and extended his empire beyond the Vindhyās. But very soon, he was supplanted in Deccan by the Sātavahanās of Pratistān. He was a man of great foresight and played a decisive role in integrating north and south.

The Sātavahanā king Vasisthiputra, the illustrious son and successor of Gautimi Satakarni, for the first time introduced ship-type coins which show his interest in promoting shipping. His coins in lead, circular in shape, depict both doublemast and singlemast ships in water. His successor, Gautamiputra Yajna Sri, continued the minting of such coins and many of them have been found on the south-east coast. A unique coin, points out Dr Sarma, now in the British Museum, portrays cargo boats approaching a ship. The obverse doublemast ship-type coins of lead continued to be issued by the Salankayanas who succeeded the Sātavahanās in the Vengi country.⁵

The Tamil country prospered under the Trairajya or the three kingdoms of Pandyas, Cheras and Cholas. In the first century BC, the trade of South India with the Roman Empire had reached enormous proportions. Muziris on the west and Arikamedu on the east coast were great emporia of Mediterranean trade. A Tamil classic of first century AD, describes the port of Kaveripattinam in a poetic vein: "The sun shone over the open terraces, over the warehouses near the harbour, and over turrets with windows like the eyes of deer. In different places of Puhār the onlooker's attention was arrested by the sight of the abode of *Yavanas* whose prosperity never waned. At the harbour were to be seen sailors from distant lands."⁶

The people of India were infused with a spirit of pride and patriotism. Constant contacts with foreign merchants had broadened the mental horizon of Indian sailors. When businessmen from far off countries could come to India, should Indians remain confined to their own land—they would have reasoned. An urge for adventure was in the air. They had a vast variety of merchandise, built and owned spacious ships, and were good navigators. If the Buddhist monks could sail to far off lands for missionary work, why should they not go for business and explore the Land of Gold. The Mauryas had laid the foundation. The successive kings had built on it. In the first century, BC/AD, scene was set for the big leap in Southeast Asian and Far East regions.

Fortunately, growth and development of Indian shipping in this part of the world have been well researched by eminent scholars. The records are based on material produced locally in various countries, mainly available in the Chinese and Javanese papers, and to some extent in Indian references. These are supplemented by archaeological and epigraphical evidence. Prof. Needham gives authentic information in his *magnum opus*—*The Civilization and Sciences of China*—in no way confined to incidents which happened in China alone and covers a wide range.

G. Coedes as edited by Walter F. Vella and translated by Susan Brown Cowing may be called the Archbishop of Southeast Asian studies as also another French savant, Sylvain Levi. Among Indians, R.C. Majumdar has conducted remarkable researches in this area and his contribution has been appreciated by our 'Archbishop'. Majumdar has shown, how small isolated Hindu kingdoms in different parts of Cambodia—which then included many more lands than at present, were welded into a mighty kingdom stretch-

ing from the Bay of Bengal to the Sea of China surpassing anything known so far in India. Good information can also be gleaned from Buddhist literature.

Some Misconceptions

Before dealing with Indian shipping in the waters of Southeast Asia and Far East, it is better to begin by removing what in our view are some misconceptions. First, the emigration of Indians to these lands has been called by such learned scholars—K.M. Panikkar, R.C. Majumdar and George Coedes—as ‘colonisation’. Secondly, the peace-loving nature of the emigrant Indians has been given more emphasis than due. There is some truth in these propositions but it is not the whole truth.

To call the countries where Indians went and set up empires as ‘colonies’ - and the process as ‘colonisation’ - is not an apt description, as we understand a ‘colony’ today. The dictionary definition of a ‘colony’ says “a country, controlled by a more powerful country, which uses the colony’s resources in order to increase its own power or wealth.”⁷ Apart from the missionaries who had nothing to do with earning wealth, the merchants and traders who undertook business voyages at great risk did try to make legitimate profit on their investment. But the Indian rulers who settled in these countries seldom transferred the wealth they earned to the mother country. Rather, they adopted the land and the people as their own and ploughed back the revenues they accumulated in the welfare of the local people and the enrichment of the culture of the adopted country.

There was never an attempt by any ruler to exploit natural resources, export raw materials to their principals in India, and dump manufactured goods upon the people

extorting an exorbitant price. They gave good government to the people, maintained law and order and encouraged indigenous industrial development. Even the philosophical and religious ideas they held dear were never propagated by force and were absorbed by the people on their own. They conceded that the foreign visitors carried cultural values which were far superior to their's. In many cases the immigrant Indians emerged as natural masters and were welcomed with reverence.

The wealth earned by the Indian rulers was mostly utilised in building beautiful monuments and temples, some of which are considered the marvels of world art and architecture. These include Borobodur in Java (750-800 A.D) and the great temple of Angkor in Cambodia (12th century). Both, and many more, are architectural and art masterpieces erected with great love and care—and of course with enormous money—by the Buddhist and Hindu rulers. Such mute monuments to the munificence of Indian rulers, and no exploitation of natural resources, are antithesis of 'colonisation'.

The peaceful professions of early Indians have been exaggerated. It is true that they did not go to other peoples' lands with sword in hand to kill and conquer. Nor were they ever found wanting to defend their own sovereignty with grit and guts. In the beginning of the Christian era, there were constant naval battles between the Indian rulers of Cambodia and the Kings of Annam. Srivijaya and Shailendra empires pursued well planned naval policies to keep under control strategic sea passages to ensure a commanding position in the commerce of south seas.

Similarly on the west coast, the Hindu Zamorin of Calicut had a well-knit navy. True, it was no match to the

Portuguese naval force which had the advantage of superior armament and pinpoint striking power. Nor did Indians resort to such savage barbarism and inhuman cruelty which the Portuguese perpetrated to overawe the inhabitants.

But Indian navy of the Malabaris and Marathas was good enough to harass the Portuguese and keep them at bay for as long as a hundred and fifty years. The descendants of the warriors of the *Rāmāyana* and *Mahābhārata* could not be expected to abstain from a righteous war. It is interesting to note that almost all Hindu gods and goddesses are shown as wielding one weapon or the other.

The Advent of the Buddha

In point of time, the first people who went from India to Southeast were the greatest protagonists of peace and non-violence. The process was initiated by the Buddha who was born in 623 BC⁸ in a royal family. The Buddhists believe that the Buddha himself went by sea to Ceylon, not once but thrice—first at Bintenne (in central plain) marked by a *dagoba* erected in his honour, second at Nagadipo (in northern part); and third at Kolani, a few miles from Colombo.⁹

In the *Dialogue of the Buddha* in the *Kovaddha Sutta* of Digha dated around the fifth century BC, the Buddha says: ‘Long ago ocean-going merchants were wont to plunge upon the sea, on board a ship, taking with them a shore-sighting bird free. And it would go to the East and to the South, and to the West and to the North, and to the intermediate points and rise aloft. If on the horizon it, caught sight of land, thither it would go, but if not, it would come back to the ship again. Just so, brother...’ For how long the merchants were

undertaking business voyages, we do not know for sure, but certainly much before the Buddha.

He was followed by Buddhist monks and missionaries who went far and wide to spread the message of their master. The details about when, where, how these monks travelled have not been properly recorded by them. Besides the corpus of the Buddha's teachings in Pali, Prakrit and Magadhi, information about their peregrinations can be found in Buddhist texts like *Matra Vamsa*, *Pitakas* and *Jātakas*. They speak at length of ocean-going vessels capable of carrying hundreds of passengers.

Mahāvira, a contemporary of the Buddha, who started another religion, Jainism, confirms sea voyages. Jain works specially *Avasyakachurnī* and *Brihatkalpasūtrabhāṣya* are full of incidents concerning sea voyages and contain extensive nautical jargon. References to their sailings are also available in the writings of other countries.

The emphasis of the monks in their writings was naturally on the teachings of the master and on how they brought the people—kings and commoners—into the fold of the *Sangha*. They were missionaries not historians. It was not material for them to mention the dimensions of the ship in which they travelled. How many masts, sails or decks it had? With what timber and how it was constructed? The exact sea-route, the ship undertook, what ports it touched, how many hazards it encountered and how were those encountered? Here and there, now and then, some incidents are recounted which are enough to testify regular sailings in large ships to different parts in the Southeast Asian region.

In the third century BC, it is well-known that Asoka the Great sent his son Mahendra with a personal message to the King of Ceylon. His voyage was organised in the right royal fashion having a large retinue including four *sthaviras* to explain the tenets of Buddhism. Later, Mahendra's sister, Sanghamitra, undertook another voyage to Ceylon during the reign of Devanamapiya Tissa (247-207 BC) for the specific purpose of ordaining queen Anula and her companions. A branch of the Bodhi tree under which the Buddha attained enlightenment, was also planted in the island. The numerous inscriptions in Brahmi and widespread remains of *viharās* and *dagobās* clearly establish that there were constant contacts between the two countries.

First Permanent Settlement

The *Mahāvamsa*, which records the history of Ceylon, says that the Great Dynasty of Singhalese was founded by an Indian prince of Kalinga in the sixth century BC. At that time the ancient kingdom of Kalinga covered a vast area comprising not only the coastal regions of modern Orissa but also the adjacent districts of modern Andhra Pradesh and Bengal. The prince was the son of the king of Kalinga called Singha (Lion) and was banished from the country by his father for lawlessness. The prince sailed south and landed in Ceylon where he married a Veddha princess. As a result of this union, their progeny came to be known as 'Singhalese' (the Lion Race). "The Veddhas were the earliest authentic inhabitants of the island known for their immense vitality, inventiveness and enterprise..." As far as can be ascertained, this was the earliest permanent Indian settlement in the islands of South seas.

If the Western and Eastern ghats of India are the two strings of a necklace, Ceylon appears to be its pearly

pendant. Ceylon is mentioned in the epic of *Rāmāyana* as Lanka which was attacked by the Ayodhya prince Rāma with a great army. Whoever heard of floating stones, it is only a poetic hyperbole. The army must have crossed the intervening sea on ships. The 'flight' of Hanuman over the sea, sans imagery, would mean that he travelled in a fast ship fitted with sails.

Homer gathered his material for that part of the *Odyssey* (speaking of Ulysses and Circe) from the eastern mariners recounting the legends of Taprobane as the Greeks called Ceylon. Taprobane, according to Tresidder, comes from Sanskrit meaning 'the great pond' or 'a pond covered with red lotus', or might have been derived from the Pali '*Tamba Vanna*'. The Arabs called it *Serendib* or *Tenerisim*, the 'Isle of Delight', and believed that human generation began there with a union between Adam and Eve. The Chinese referred to it as *Pa-on-tchow*, the 'Island of Gems', and the later Tamils as *Ilanare*. It is sufficient to show that this tiny island was frequented by many nations and lay on the highway of international shipping.

According to various authorities, prince Vijaya landed in Ceylon in the year of the *Mahāparinirvāna* of the Buddha generally accepted as 543 BC. The event of Vijaya's landing in Ceylon excited much interest and was so deeply impressed upon the minds of the people that centuries later, the artists of Ajanta in their murals in Cave No. XVII have faithfully depicted that great day. Tamils had built a strong navy and attacked Ceylon in the second century BC. They succeeded in occupying the northern portion of the island but were later expelled by the Singhalese King Dutthagamini.¹⁰ It shows that by then Indian navy had not acquired sharp teeth.

The extension of India into the Southeast Asia and Far East was an event of historical importance, not only to India

and the region concerned but to the entire world. It gave fresh impetus to shipping industry, expanded trade and commerce and took the message of Indian thought and culture which brought into being the rarest flowers of art and science.

Says the great French savant, Sylvain Levi: "Mother of wisdom, India gave her mythology to her neighbours who went to teach it to the whole world. Mother of law and philosophy, she gave to three-quarters of Asia, a god, a religion, a doctrine, an art. She carried her sacred language, her literature, her institutions into Indonesia, to the limits of the known world, and from there they spread to Madagāscar and perhaps to the coast of Africa, where the present flow of Indian immigrants seems to follow the faint traces of the past."¹¹ From this, Indianization was born, adds Coedes, "a series of kingdoms which in the beginning were true Indian states: Cambodia, Champa and the small states of the Malay Peninsula; the Kingdoms of Sumatra, Java and Bali; and finally, the Burmese and Thai kingdoms, which received Indian culture from Mons and Khmers."¹²

In earlier times all the countries of this region - Cambodia, Siam, Indo-China, Malaya, Indonesia and smaller islands - were collectively called in India *Dvipāntara* and "culturally regarded as an integral part of Bhāratvarsha".¹³ Linguistic and ethnological researches indicate that intimate relations existed between the peoples of *Dvipāntara* and India from prehistoric times. Sylvain Levi is of the view that much before the merchants and missionaries went to these parts of the world, the shipping routes had already been delineated by the mariners of another race including Mudra and Malava "whom Aryans despised as savages."

Majumdar points out that the Mon-Khmers migrated from India in prehistoric times and their language is derived

from the Munda tribe of central India and Khasi tribe of Assam. Two other groups were the Chams who lived in Annam, formerly known as Champa, and the Malays who settled in the Peninsula. These belonged to a larger group which today constitutes the predominant part of the population of Sumatra, Jāvā, Bāli and other islands.

This assumption is based on the linguistic affinities existing between the primitive tribes of India with Mon-Khmer and allied languages grouped together in the family called Austro-Asiatic and their connection with Astronesian family to which the Malays belong. The Dutch archaeologist, Nicholaas J. Krom, advances a hypothesis that it were Indonesians who colonized India in prehistoric times. Westernitz reconciles the two views by saying that emigration could have occurred either way, or from a parental branch of both.

What can be safely surmised is that shipping between India and Far East had been in vogue much before records were maintained. It gained momentum after the birth of Buddha when Indians from Orissa/Bengal, Gujarat and later from South India had regular sailings to the region. Some soothsayers had predicted that Gujarat will be destroyed—it is still surviving—so the king sent his son to Jāvā. “He embarked with about 5000 followers in six large ships and about a hundred small vessels and after a voyage of four months reached an island supposed to be Jāvā.”¹⁴ Since it was a case of mistaken identity, the father sent a reinforcement of 2000 people and the prince ultimately reached Jāvā. There are sayings in Gujarati language that if one wants to get rich, go to Jāvā.

One difficulty in dealing with the Southeast Asia region is that it has no physical unity like that of India or China.

There are numerous islands, archipelagos, peninsulas, among which run narrow straits and small or big gulfs. The political authority of these islands had been changing hands quite frequently and the basic objective of every potentate had been to control strategic straits and sea passages so as to dominate trade and commerce passing through them. That is what is of concern to us and not the geneologies of all the kings and queens except a few major ones. The region lies at quite a considerable distance and the merchants, mariners as well as political adventurers had to travel over long stretches of open sea. It indicates that by the first century AD, or a little earlier, sturdy ocean-going ships were commonplace in India so as to venture over high seas.

There were mainly two sea routes Indians could take - start from Tāmralipti or any other port on the east coast, hug the coast of India and Burma, go over the Gulf of Martaban, keep close to Tenasserim and land at the Malayan port of Kedah. Or to take a ship at Sopatna (Madras) or Padouke and cross over the high seas to reach Achin, the northernmost port of Sumatra.

From modern Madras to the nearest point of Sumatra, it would be a distance of about 2000 km. From Cambay Gulf to Colombo would be more than 900 nautical miles. There are two main straits - the Strait of Malacca between Malay and Sumatra and the Strait of Sunda separating Sumatra from Java. If the strait of Malacca, which is another 600 km from Achin, is blocked by some power then one has to go via the Strait of Sunda which would mean a sailing of another 2000 km from the nearest Indian port. The effort of the Indian empires, like those of Srivijaya and Shailendra, would have been to acquire a commanding position over these straits. (See Map III) The ships of any nation which

wanted to trade with China will have to use the ports first in Sumatra and Java, and later in Cambodia, to take supply of fresh water and other essentials before proceeding further to China.

According to Coedes: "Those seamen who, proceeding from southern India to the countries of gold, did not coast along the shores of Bengal but risked crossing the high seas, were able to make use of either the 10-degree channel between Andaman and Nicobar or, farther south, the channel between Nicobar and the headland of Achin. In the first case they would land on the peninsula near Takuapa; in the second, near Kedah. Archaeological research has uncovered ancient objects at these sites".¹⁵

The Malay Peninsula in the south looks like the head of a serpent, his narrow body moving northward. It has a number of ports on either coast. On the western side, the main ports are Trang, Takuapa, Baruas and Malacca on the Strait of Malacca. On the eastern side moving down from north are the Isthmus of Kra and the ports of Chumphon, Chaiya, Ligor, Phatthalung, Singora, Pattani, Saiburi till we reach the tongue of the serpent, as it were, in Singapore. (See Map IV)

The Chinese junks had been passing through the south seas on way to India and further west to the eastern coast of Africa since the seventh century BC. It is surprising that they never thought of extending their empire to this region. The credit of founding the first permanent settlement in these countries and islands of Southeast Asia and the Far East goes to the Hindus of India. In case of Ceylon the visit of the Buddha may be in doubt, but his followers certainly went all over the places soon after.

The royal missions of prince Mahendra and his sister in the fourth century BC are well-documented. The banished prince Vijaya of Kalinga arrived in the fifth century BC as mentioned in *Harivamsa*. The Hindus emigrated from various parts of the country - mainly from Kalinga, South India and as far west as Gujarat. The so-called Dravidian stream by then had been completely Aryanized. In the social hierarchy of those days, Brahmins were on the top and were sought after to perform rituals at birth, thread ceremony, marriage and death. They conducted the coronation of kings and performed numerous *yajnas* for their clients.

We hear of repeated embassies sent by Hindu kings to the emperors of China. That did not mean that these kings were vassals of China or the writ of Chinese emperors ran over all the Hindu kingdoms. It was mainly a public relations exercise of sorts to enhance the status and prestige of China in the eyes of the world. The officials of the Chinese dynasties were always on the move in the neighbouring countries vigorously persuading the local rulers to send an embassy to their emperor alongwith some gifts. In return, the visitors received official recognition, some awards and trading facilities. The Chinese emperor was pleased, the officials were rewarded, the public was puffed up seeing the 'supremacy' of their king, the Hindu rulers did not lose anything and earned great goodwill and security for themselves and facilities for their merchants.

When the Hindus went there, like the Panis alongwith the Cholas and Pandyas who emigrated to West Asia, they took along with them their myths, gods, customs and traditions. For running administration, *Arthasāstra* provided a perfect model. The religious rituals and social manners were readily accepted. In many cases it was like a 'home

coming'. It rang a bell and old ideas and ideologies were exhumed. The new arrivals and the indigenous inhabitants appeared to have known each other.

Most of the locals were well-behaved and as the culture of the visitors was far superior to theirs, there was no opposition much less confrontation. Rather this contact led to the efflorescence of a more refined and polished polity and culture. The angularities were rounded off. The roughness was smoothened. The conflicts common in the mother country were compromised. The Farther India emerged like a model of synthesis and reconciliation. On many islands and in several Southeast Asian countries, the devotees of *Siva* and *Vishnu* joined hands and created a new deity in the form of *Uma Hari*. The Buddha was regarded as the younger brother of *Siva*.

In order to properly understand the developments in the region, it is necessary to know about some rather unusual practices prevalent there. First, a king often lent his name to his kingdom, and its capital. We have for example Srivijaya standing for the name of the king, name of his empire as well as its capital. Secondly, there was a general belief—as in India—that gods reside on mountains. To share the reflected glory of godhead, many kings kept the nomenclature of their dynasty associated with mountains. Funan is the rendering of Old Khmer *Bnam* which in modern version is *phnom*, meaning 'mountain'.¹⁶ Perhaps the original name of the kingdom was *Sri Saila* which indicates association with mountains and that may be the origin of the later Shailendra dynasty. Thirdly, a number of Hindu kings acquired a new name on coronation, and yet another after death. Fourthly, these kings were called by different names by the Indians, Chinese and the Arabs and sometimes it becomes difficult to establish their identity.

Just as the Romans had picked up the idea of god-kings from Egypt, Indian kings also traced their genealogy to one god or the other among whom the Suryavanshi and Chandravanshi were the two main branches. The same idea was imported into Farther India. This background may help to understand the activities of the kings and queens and the commoners in this part of the world.

First Hindu Kingdom

The first kingdom set up by Indian mariners in South-east Asia was that of Funan which roughly corresponds to modern Cambodia proper, and a part of Cochin China.¹⁷ The centre of the country was located on the lower course and delta of the river *Mekong*—the modified form of *Mā Gangā*. The political boundary at its apogee must have encompassed southern Vietnam, the central Mekong, a large part of the *Menam* valley and the Malay Peninsula. Its capital for some time was Vyādhapura situated in the vicinity of the hill of Ba Phnom and not far from the site of Oc Eo, a port and an emporium where most probably the Indians might have embarked. Several other kingdoms followed.

The foundation of the “most important” of such kingdoms was laid by a “Hindu missionary, Kaundinya (Hunt’ien)”.¹⁸ The *History of the Liang Dynasty* confirms that Kaundinya was a Brahman and an inhabitant of India.¹⁹ One day he heard, as the legend goes, a supernatural voice asking him to go and reign in Funan. Directed to embark on a large junk with a divine bow, which was given as a gift to him by a genie, he boarded a ship and landed in Funan.

The queen of the country, Liu-ye, “Willow Leaf,” wanted to pillage and seize the ship. Kaundinya shot an arrow from his divine bow which pierced through the ship

of Willow Leaf. Frightened she gave herself up, and Kaundinya took her for his wife. He governed the country, introduced Indian laws, manners and customs and passed on the power to his descendants. According to an Indian legend, faithfully reported in a Sanskrit inscription of Champa, Kaundinya having received a javelin from Asvatthama, son of the famous teacher Dronacharya, threw it to mark the location of his future capital, married a daughter of the king of the Nagas named Soma, who gave birth to a royal line.²⁰

Kaundinya is a very important name in the history of Farther India. It will spring up again and again in various places where his descendants ruled. The kings of other countries took pride in tracing their connection with this great king to claim royalty. Kaundinya and his successors ruled over Funan for about a hundred years. The last king gave the care of his affairs to his great general *Fan Shih-man*, in short *Fan Man*, identified as Sri Māra mentioned in the venerable Sanskrit stele of Vo-can in what is now South Vietnam, the region of Nha-trang. He was brave and capable. With his powerful troops, he attacked the neighbouring kingdoms who all became his vassals. He himself took the title of the Great King of Funan.

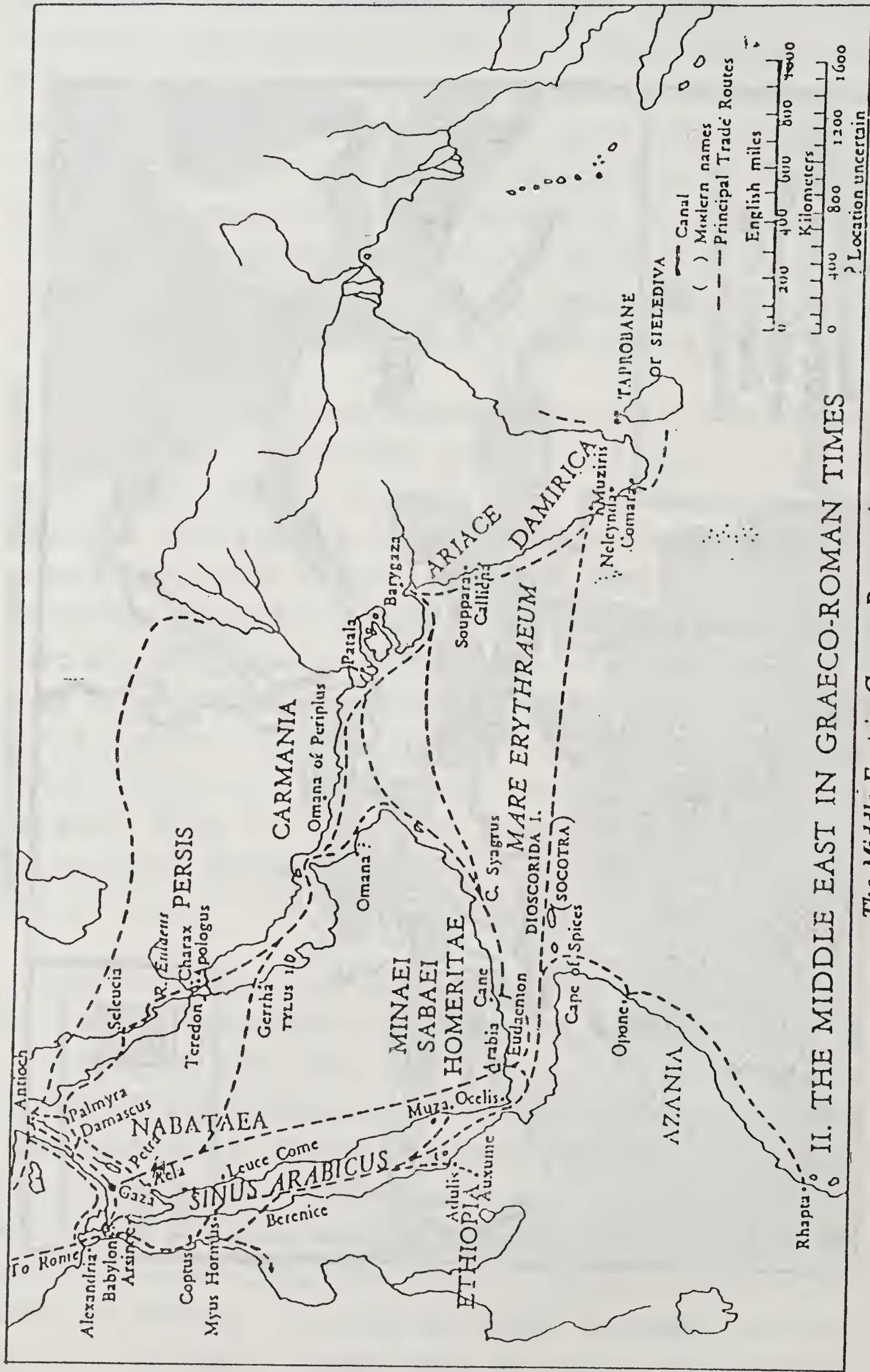
He built large ships and “sailing over the immense sea, he attacked more than ten kingdoms, including those of Ch’u-tu-K’un, Chiu-chih, and Tien-sun. He extended his territory five or six thousand *li*” (1000 *li* = 400 km).²¹ In the third century AD “Funan conquered nearly all the Malay Peninsula viz. the Indianized states of Tambralinga, Pan Pan and others...”²² Thus, starting from the southern tip of the present Cochin China, the Funan Kingdom moved to the delta of *Mekong* river and gradually extended over the modern Cambodia, Annam along the valley of the *Menam* river, and down into the Malay Peninsula.

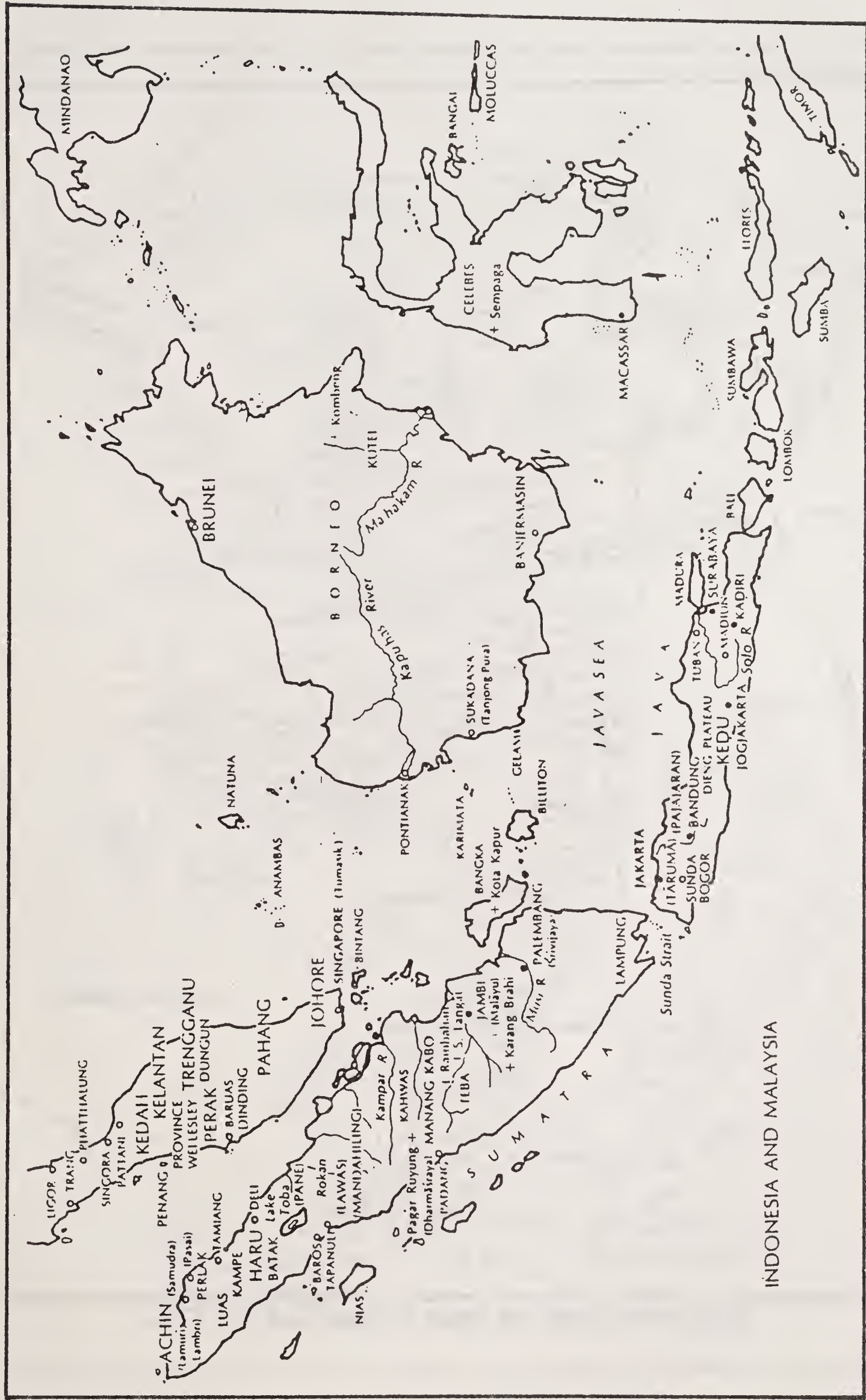
Possible Outline of
EUROPE & Western ASIA
at the Maximum of the
Fourth Ice Age
(about 50,000 years ago)



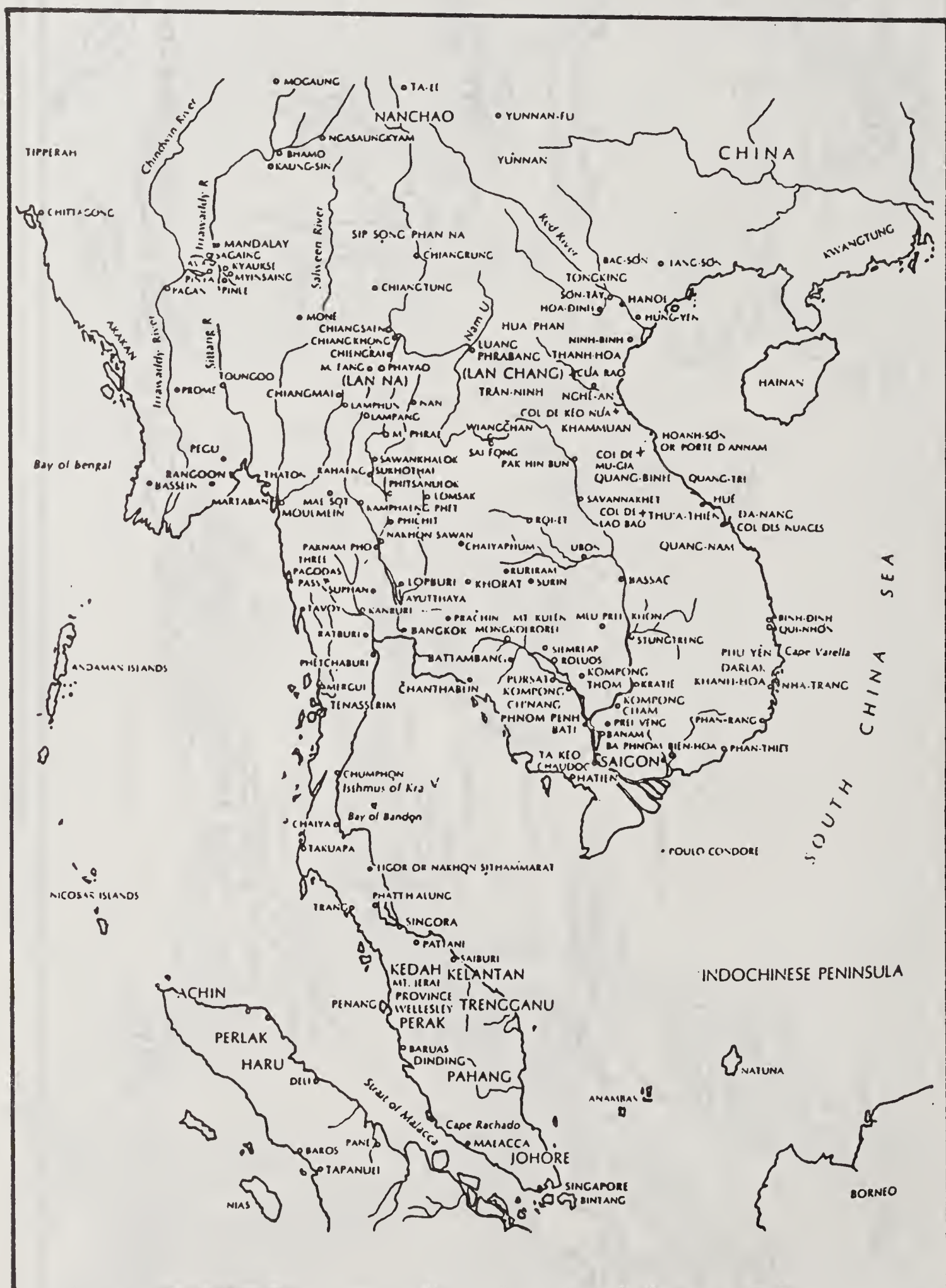
- Land
- Water
- Ice
- Present-day coastline

Europe and Western Asia about 50,000 years ago





Indonesia and Malaysia



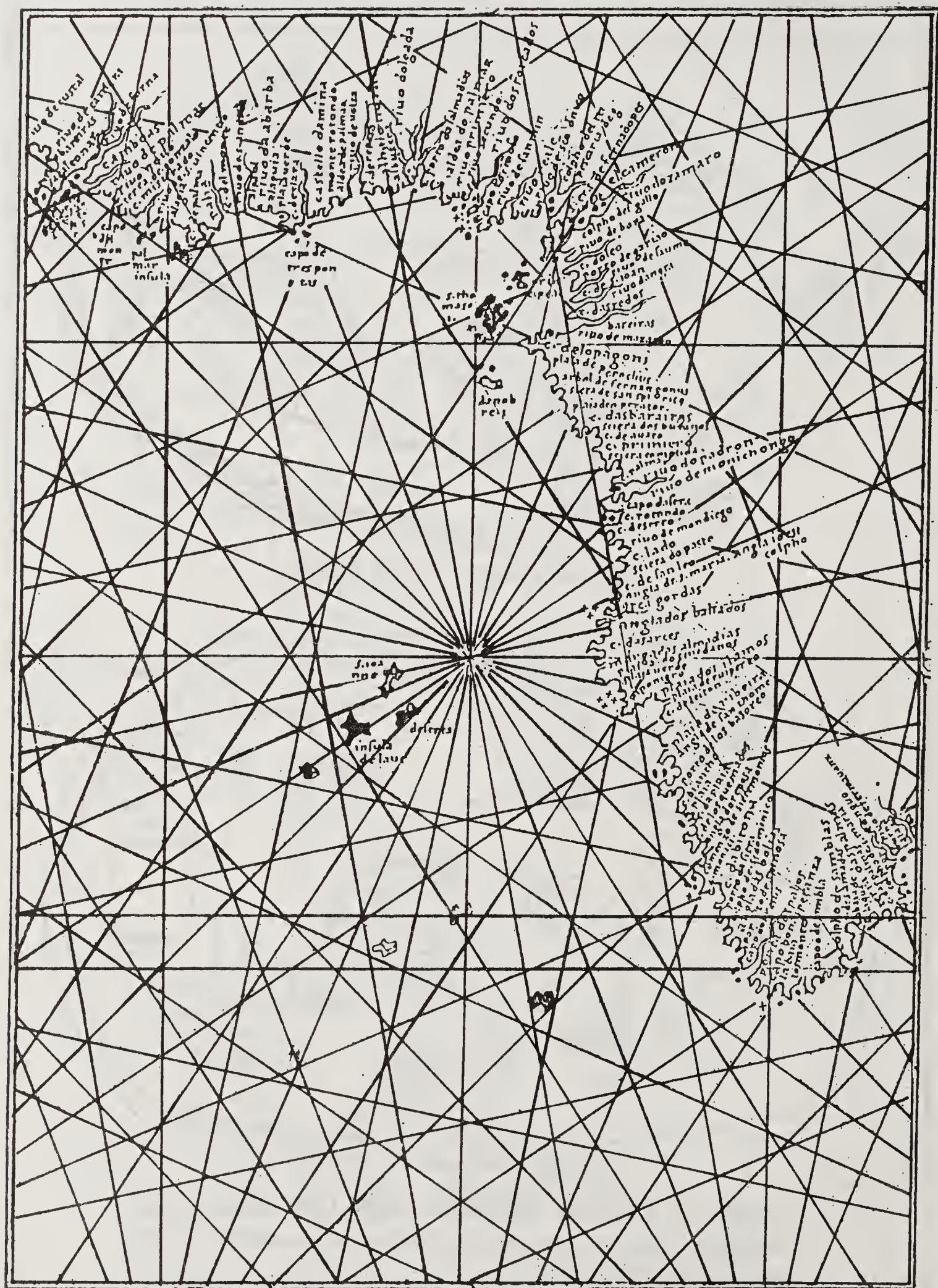
Map showing ports and straits in Malay and Indo-China



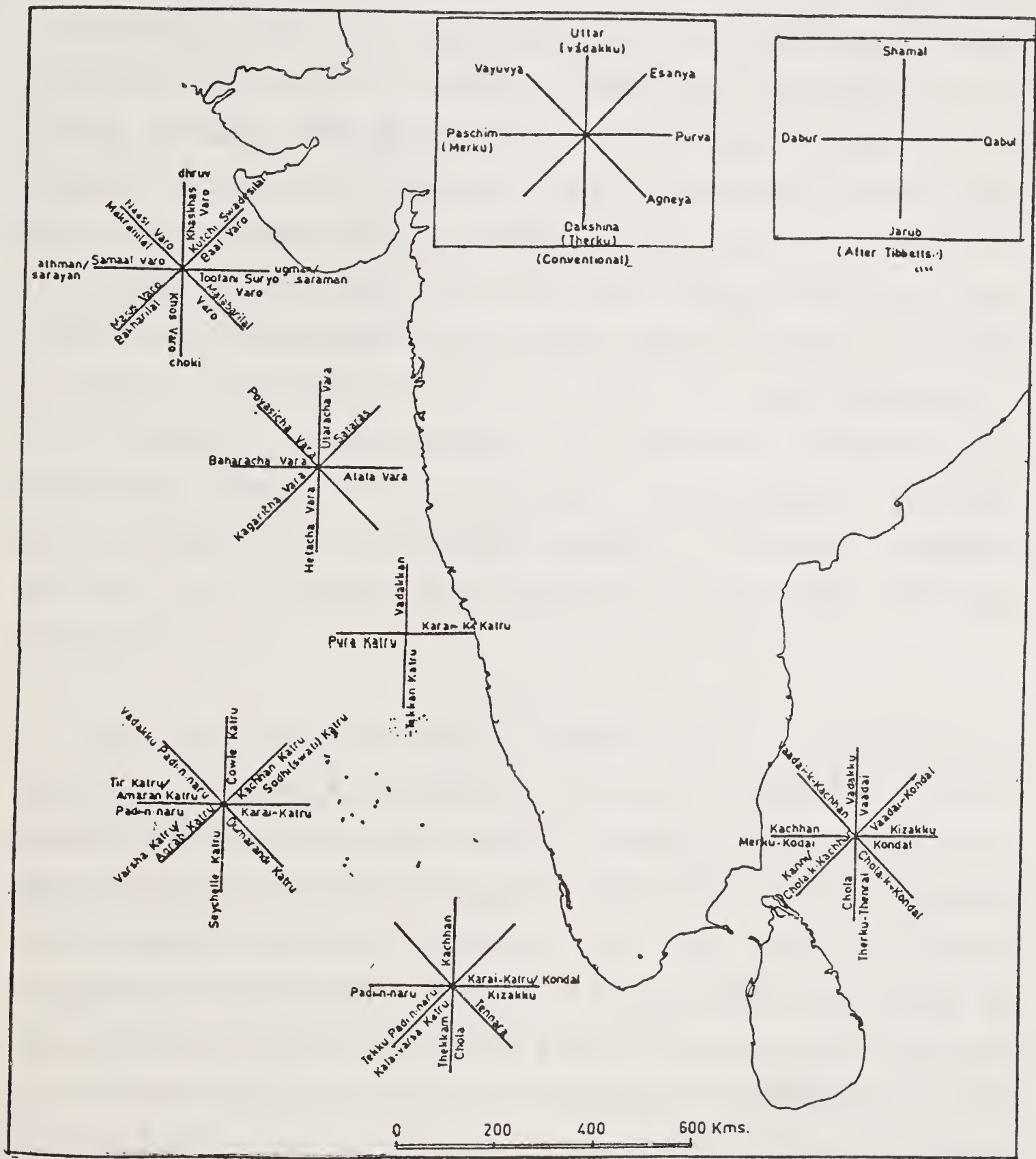
Ptolemy's outline of the world.



Outline of Henricus Martellus's map 1489 showing the dramatic change made on the face of the world by Dias' voyage of 1487-88



The coasts of West and South Africa on an Italian chart of c 1508



Map of India of wind-rose

In 357 AD, Funan fell under the domination of a foreigner called *Tien Chu Chan-tan* in Chinese and, as *Tien Chu* is the Chinese name for India, he also came from India. Sylvain Levi has shown that *Chan-tan* is a transcription of *chandan*, a royal title in use among Indo-Scythians.²³ About the same time all of northern India had submitted to the Gupta dynasty. He drove out the Scythian invaders and it is quite likely that a branch of the Kushan family driven from the banks of the *Ganga*, sought its fortune beyond the Bay of Bengal in the Land of Gold. This supposition goes well with an embassy from Funan sent to the Murunda prince who is said to have been a Scythian. That was the beginning of the Scythian contacts with the Southeast Asian region and they came up occasionally in the later centuries. For example, in the seventh century a Scythian Brahman arrived from Deccan and married the daughter of King Ishnavarman I.

At the end of the fifth century AD, a descendant of Kaundinya called Kaundinya Jayavarman carried for the first time the Indian honorific suffix *Varman*.²⁴ This prince sent his merchants to Canton along with a Buddhist priest Nāgasena with suitable presents seeking the help of the Chinese emperor to subdue the King of Champa. But on return the merchants as well as Nāgasena were thrown upon the coast of Champa. It was during his reign that two Funanese monks visited China and translated the sacred Buddhist books into Sanskrit.

Jayavarman was a great king held in high esteem by the Chinese emperor. On the 'occasion of the embassy of 503, an imperial order says: "The King of Funan, Kaundinya Jayavarman, lives at the limits of the ocean. From generation

to generation he (and his people) have governed the distant lands of the south. Their sincerity manifests itself afar; through their many interpreters they offer presents in homage; it is fitting to reciprocate and show them favour and accord them a glorious title. This is possible with the title of General of the Pacified South, King of Funan.”²⁵

The “Great King of Funan” died in 514. Funan was “the dominating power” on the peninsula for five centuries. Even after its fall, the memory of its glory echoed in the corridors of history for generations. The kings of pre-Angkorian Cambodia regarded it as an honour to relate their origin to the kings of Vyādhapura and the later Javanese sovereigns of the eighth century revived the title Shailendra, “king of the mountain”. The civilization that developed in the valley of the *Mekong*, records Coedes, “prepared the soil for the efflorescence of Khmer civilization, one of the most beautiful flowers that Indian influence has produced in India beyond the *Ganges*.”²⁶

From the viewpoint of Indian shipping, Funan occupied a privileged position and the Chinese Kingdom of Wu sought to procure luxury goods from India through the Funan seas. The Kingdom lay on the route of maritime commerce and constituted an inevitable way station for seamen who used the Strait of Malacca. Many more who crossed the isthmus of the Malay Peninsula had to pass through Funan. “It was also the terminus for navigation hailing from the eastern Mediterranean, if it is true that the Kattigara of Ptolemy was located on the western coast of Indo-China.”²⁷ It is fairly certain that the foundation of Indian shipping and shipbuilding industry in Southeast Asia was laid down by Funan.

About the same time, that is by the fifth century AD, Indian seamen had also reached and settled in Indonesia and several islands of the Far East. According to Javanese traditions, the Hindus founded the state of Java in 56 AD. The Hindu hero is said to be Aji Saka who claims his lineage to the king of the *Mahābhārata*. Another legend gives the credit to the people of Kalinga. It is said that “20,000 families were sent to Java by the prince of Kalinga. These people prospered and multiplied.”²⁸

In the second century AD, Ptolemy refers to the island of Javadion (Javadvipa or Yavadvipa of the *Ramayana*) which shows that the Indian name was much earlier. In 132 AD king of Java named Devasarman sent an embassy to China. Four inscriptions in Sanskrit of King Purnavarman, perhaps of the fifth century AD, have been found in Western Java which recall his father and the grandfather, indicating that the rule of this Hindu King commenced much earlier. From its geographical position, it could be surmised that Sumatra should have been the earliest to have been reached by the Indians.

The northern tip of Sumatra is hardly 40 km from the southern-most Pygmallion Point of India, now renamed Indira Point. When I had gone there in 1975 for the inauguration of a lighthouse by the then Vice-President of India, G.S. Pathak, the local people complained that the boats from Sumatra frequently visited their island. They cut the trees and took away the timber. It lies midway between India and China and must have developed many harbours and trading centres on the north-eastern coast from an early period. But the earliest Hindu kingdom at Palembang was that of Srivijaya in the fourth century which rose to great eminence in the seventh century AD. The people of the

garden island of Bali accept Kaundinya as their ancestor and it is the one island in the entire Southeast Asia which has retained the continuity of Hindu culture.

In the Far East, Borneo was reached not later than the fourth century as borne by the discovery of seven Sanskrit inscriptions in the district of Koti (Kutei).²⁹ The inscriptions are engraved on stone pillars (*yupa*) to commemorate the rich donations of King Mūlavarman, grandson of King Kundunga or Kaundinya. Mūlavarman performed the *Bahu-Suvarnakam* sacrifice when he gifted large quantity of gold and 20,000 cows to the Brahmans.

The rivers *Kapuhās* in the west and *Mahakam* in the east had safe harbours fed by a rich hinterland to attract merchants from distant parts. The island was called *Po-ni* by the Chinese and is mentioned as *Varhina-dvipa* in the *Vāyu Purana* (ch. 48-V.12).³⁰ The octopus-like island of Celebes east of Borneo seems to enjoy the credit of having the most ancient image of the Buddha carved in Amarāvati style (Kushan period, about second century AD). Thus it will be seen that in the early centuries of the Christian era, the sea voyages of the Hindus in Southeast and the Far East were very extensive covering many seas, negotiating numerous narrow straits and isthmuses, ranging from Ceylon in the west to Celebes in the east.

At the end of the fifth century AD, a former vassal state of Funan around middle *Mekong* in the region of Bassac called Chenla, broke the ties of tribute and finally attained independence. The name of the King was Chitrasen, in Chinese *She-to-ssu-na*, who “seized Funan and subdued it.”³¹ Chenla was a part of Cambodia and the origin of the family of Chitrasen goes back to the union of the hermit

Kambu Svayambhuva with the celestial nymph, Mira, given to him by Siva. This is similar to the genealogical myth of the Pallavas of Kanchi and suggests a kinship between the two families.

The Kingdom of Champa

Meanwhile, a great naval power of Champa rose on the eastern coast of what today constitutes north and south Vietnam, or old Annam. The geography of this region formed the basis of its history. This narrow strip of land had sea on the east and high mountains on the west and comprised a large number of river valleys. As such, it was difficult to communicate through land routes and easier to contact each other by means of sea. The inhabitants therefore had to be born sailors and developed a strong navy. The Hindu kings of Champa claimed to be the descendants of Sri Māra by the female line and generally suffixed the honorific of Varman, in Chinese *Fan*. They mounted many naval expeditions on the Chinese in the north and wrested from the Chinese, their territory which they had usurped as early as 214 BC.

There were ups and downs in these naval wars but the Cham incursion in 137 AD was quite successful. In that year about 10,000 Chams attacked the southernmost Chinese districts and, according to Majumdar, “destroyed the ports and ravaged the whole country.”³² During the reigns of *Fan Fo* (349-80 AD) and *Fan-Hu-ta* (380-413 AD) there was a continual war with the Chinese who inflicted a severe defeat on *Fan Fo* in 358 AD. He had to cede the district of Nhut-Nam which was recovered later by *Fan-Hu-ta* who carried his arms further into the north.

In 431 AD, another Champa king sent an expedition of more than 100 vessels to pillage the coast of Nhut-Nam. In

446 AD, the Chinese dealt a crushing defeat and got away with immense booty. The ding-dong battles between the two contenders went on for several centuries and the point to note is that a coastal small kingdom was bold enough to carry on naval encounters with a powerful neighbour.

The Indians who settled in the Southeast Asia must have been not only naval strategists to reckon with but also superb shipbuilders. The ships in which they first embarked from the mother country must have formed the model on which they raised naval fleets adapting the design to suit the local seas and shipbuilding materials.

The Empire of Srivijaya

The real successor of Funan, according to Harrison, was the kingdom of Srivijaya. Some five inscriptions found on the islands of Sumatra and Bangka testify to the existence in 683-86 AD of a Buddhist kingdom at Palembang which bore the name of Srivijaya. The Chinese pilgrim I-Ching on his first voyage from China to India in 671 called on *Fo-shih*, by which name he calls Srivijaya, within twenty days of his departure from canton. "In the fortified city of *Fo-shih*," he says, "there are more than a thousand Buddhist priests... They examine and study all possible subjects exactly as in Madhyadesha (India); their rules and ceremonies are identical with those of India."³³

The oldest of the five inscriptions records that on 23 April 682, a king began an expedition (*siddhayātra*) by boat and a month later "brought victory, power and wealth to Srivijaya."³⁴ This king, whom Coedes identifies as Jayanāsha, sent the first embassy to China in 695 which were followed by others in the years 702, 716 and 724 in the name of another King *Shih-li-to-lo-pa-mo* (Shri Indravarman).³⁵

The naval strategy of Srivijaya was to control the great sea passages between India and China through expansion in the north-west direction. The King acquired important sea-ports like Malacca, Achin, Batavia, Penang and Singapore. Meanwhile, flourishing trade between the Coromandal coast and the straits continued on the west and with China on the east. Thus, Srivijaya emerged as a fully dominant commercial power around the seventh century which brought great prosperity to the kingdom in the eighth century. A marked revival of China's export trade also served as an added advantage. At that time, T'ang pottery was very much in demand and Srivijaya served as a conduit for supply of this pottery. Many broken pieces of the pottery have been unearthed at various sites in India and West Asia. The Arabs had started penetrating this region about the fourth century and they also participated in this trade.

The southeast coast of Sumatra, whose outline was then different from what it is today, was equidistant from the Straits of Malacca on the west and Sunda on the east. It was the natural point of landfall for boats coming from China riding on the northeast Monsoon. The fall of Funan led to the prosperity of Srivijaya as it led to the development of several ports and estuaries. Within a century this kingdom became the overlord of the most of Sumatra, the western part of Jāvā and the greater part of Malay Peninsula upto the Bay of Bandon. An inscribed stela dated 775 has been discovered at Ligor which commemorates the foundation of Buddhist monuments at the instance of King Srivijaya. This inscription refers to the powers of the King, the overlord of all neighbouring states whose kings paid obeisance to Srivijaya. It shows that this King inspite of being a follower of Buddhism pursued during 675 and 775, an aggressive policy.

The Shailendras

In the middle of the eighth century AD rises a new star in central Java which assumes the imperial title of Shailendras, the 'King of the Mountain', a title used by the later kings of Funan. At first, the two kingdoms of Palembang and central Jāvā remained on friendly terms but sometime after 775 AD, Shailendras wrested the Ligor region from Srivijaya. They established their authority over the Malay Peninsula and in 782 ascended the throne of Jāvā. "During the last quarter of the eighth century AD the Hindu kingdoms of Sumatra, Jāvā and Malay Peninsula had all to succumb to, or at least feel the weight of, this new power."³⁶ Majumdar, who has the honour of being the first to distinguish between the two faces of the Ligor stele "on which the assumption of Shailendra rule in Srivijaya from 775 is based,"³⁷ accepts the possibility that the seat of power of Shailendras may have been on the Malay Peninsula.

There has been widespread confusion between the two Hindu kingdoms ruling over more or less the same region and perhaps for some time at least from the same centre. The foreigners could hardly distinguish between them and at times it is difficult to say whether the Zābag Maharaja of the Arab historians and explorers stands for Srivijaya or for Shailendra kings. De Meglio always refers to the Maharaja of Zābag, as also the Arabs, as Srivijaya.

In our view all references to the Maharaja of Zābag or Zābij from the eighth century onward probably point to the kings of Shailendra dynasty, or the territories covered by the Kingdom of Srivijaya in Sumatra. The Kingdom of Zābag, says Abū Zayd of Sīrāf (d.916) extended over many islands and included Sribuzah and Rāmnī. "The area of the kingdom", says Zāyd, "is about 900 (square) Parsangs. The King

is also overlord of a large number of islands extending over a length of 1000 Parsangs or more.”³⁸

In 996, according to Masūdī - (943 AD) the empire was so extensive that “no one, even with a ship of utmost speed, can go over all the isles, which are all inhabited, in less than two years.”³⁹ The city of Kalah lying halfway between Arabia and China was an imposing town and the centre of trading in spices and aromatic essences. Many merchants attest to the efficient administration of the King. “The traveller in this country,” says one, “whether on foot or on horseback may go wherever he pleases. When he is weary of journey, or his horse is tired, he can halt where he chooses as he will always find shelter.”⁴⁰

Masūdī is lavish in his praise for the power and prosperity of the Maharaja. He says that “Kalah in north Malay lay within his realm and was the focal point where the ships of Oman and Sīrāf foregathered. The capital of the Maharaja at Palembang was lined with shops displaying all kinds of commodities.” He adds, “This King is in possession of more kinds of perfume and spices than any other King.” In the street of money-changers alone, there were 800 of them and many more were to be found in other parts of the city.

According to Buzūrg (first half of the 10th century), Sribūza, that is Palembang, possessed a magnificent bay, much wider and more secure for shipping than that of Basrā. Idrīsī (1110-66) gives another reason for the unprecedented prosperity of the Kingdom during the tenth and early eleventh centuries. About that time, China was involved in a civil war for almost a century (879-979) and many of the merchants carrying on business there thought it prudent to transfer their trading activities to the Kingdom of Zābag

where they were impressed by “the fairness, good behaviour and gentle manners of the natives, and also owing to the excellent opportunities for trade.”⁴¹

Good ports, good people, good products and good trade—what else a merchant could ask for. No wonder that businessmen from the far west in Egypt, Arabia and Oman, to far east in the extensive Chinese region, visited the ports of Shailendras and a flourishing trade took place. The trade enriched the merchants, the inhabitants of the kingdom and the king. Numerous articles were exchanged. The town of Kalah alone traded in aloe, camphor, sandalwood, ivory, tin, ebony, and so on.⁴² The islands of Sumatra proper and others specialised in spices of all sorts. The merchants from the western and eastern coasts of India as well as from the south were in majority and had their settlements at various places. The people from Gujarat were in the forefront and took full advantage of the prosperous trade. All merchant ships whether they stopped in the Kingdom of Shailendras, or went further up to China, found excellent ports for transshipping goods or for replenishing provisions.

During this period, apart from the extensive growth and development of shipping and shipbuilding, management of sea-passages and estuaries, the entire region was completely saturated with the Hindu and Buddhist cultures. In some areas, and during certain periods, either the one or the other profoundly affected the people of Southeast Asia and the Far East for several centuries. The influence of both was reflected in the art and architecture of the region.

The temples of Angkor Vat or the Buddhist monuments of Central Java constitute the heritage of the whole world. The Shailendras were great protagonists of the Mahāyāna

Buddhism and raised one of the greatest monuments at Borobodur—a remote descendant of Sānchi and Bharhut as Havell calls it. Coedes calls it as a “Buddhist microcosm” as its basereliefs illustrate the great texts of the Mahāyāna branch.

The empire of the Shailendras reached the high-water mark of its grandeur and glory in the eighth century AD. In the following century, their supremacy was challenged by the neighbouring states of Kambuja and Java. Their commercial and political greatness throughout the tenth century is testified by the Chinese sources.⁴³ Why these kingdoms, remaining in the region for nearly one thousand years could not consolidate their position? Why with a superior culture, better navigational skill, expertise in shipbuilding, efficient administration and a benign reign, they were replaced by other powers?

Why the Hindu Kingdom of Funan fell, Srivijaya collapsed, Shailendras bowed out? Alongwith them passed away the Far Eastern island kingdoms of Borneo and Celebes. Some of these empires had acquired commanding positions on strategic sealanes. They had amassed enormous wealth through a flourishing trade and income from customs duty and port charges. They had raised powerful navies, conducted successful expeditions and were not wanting in the art of warfare. Just as the emigration of Hindus and consequent development of trade and commerce in the region was a matter of international importance, so their decline and final disappearance from the scene had serious repercussions. But why did they decline and disappear?

The reasons were internal as well as external and had impact on Indian shipping. Internally, while geographical

location of these empires gave some advantages, it also created serious difficulties. In Funan region of Indo-China, the valleys of *Mekong* and its tributaries were separated from each other by high mountain ranges. Regular contact and proper control through overland routes was difficult. Particularly in northern Annam, it was easier to keep in touch with various provinces through sea than over land. Whenever a particular valley got an opportunity, it declared independence calling for naval action from the centre and dissipation of energy.

The Malay Peninsula had several chieftains right from the Isthmus of Kra in the north to the southernmost tip. Each was anxious to assert his sovereignty as and when possible. That is one reason that the kingdom of Srivijaya/Shailendra is said to have set up their capital at Ligor in the north. That made it probably easier to look down throughout the narrow neck and keep control on the harbours on either coast. Further south, the sea was studded with many islands, the major ones being Sumatra and Java.

In the north of Sumatra lay the Strait of Malacca commanding a strategic position and through this passage had to pass all the vessels which wanted to trade with Indo-Chinese countries or China proper. If that sealane was blocked by any power, the ships had to detour and seek entry into South China Sea via the Strait of Sunda. It was difficult for a power to exercise complete control over all the scattered islands, peninsulas and Indo-China which included Cambodia, Siam, Champa, Annam etc. The whole area was not a compact, contiguous landmass.

The empires of Funan, Srivijaya and Shailendra did manage to acquire sovereignty over extensive areas - it was

no mean achievement and testifies their political strategy and navigational skill - but none could maintain it for longer periods. Geography was against them and played a major role in shaping history, or may be, there is an undefined law that whatever rises must come down. Perhaps it is the eternal discontent in the human heart which compels man to move up, reach a plateau, and again make a push to climb another peak. How long he manages to stay at a peak depends upon how wide a plateau the peak has. The destinies of kings and queens rise and fall like the tide and ebb in the ocean of history.

Externally, a number of factors contributed to the gradual disintegration of Hindu empires in the Southeast. First, soon after the arrival of the Hindus, the South seas did not remain their exclusive preserve for long. The Arabs followed on their heels, and the Romans made an appearance soon after. After the advent of Islam, many India--domiciled Arabs were converted to Islam. Then the Arabs who followed the new faith started entering the region in a big way. They were supplemented by a large number of Hindus who underwent conversion. In Malay, some Hindu kings married Muslim ladies for political considerations. But the Hindu kings were so well entrenched that till their decline began, the Muslims could not secure extensive control.

Meanwhile, thanks to the visits of Buddhist monks and missionaries to China, and the attraction of the Chinese Buddhists to visit the country of the birth of the Buddha, the Chinese monks and merchants also started taking more interest in the area. It is indeed a matter of surprise that when the Chinese were seen around the east coast of Africa as early as the seventh century BC, why did they not play a greater role in the region next door earlier, allowing the

Hindus coming from a far off land to dig deep into the cultural and commercial soil of Southeast Asia.

Among the *Trairaj* of Cheras, Pandyas and Cholas, the last after several feuds gained supremacy and raised a formidable naval force. The Chinese and the Chola ships had to pass through the Strait of Malacca in the territory of Srivijaya. Efforts were made that the China-India trade might terminate at Srivijaya and from there the merchandise would be distributed by local merchants to their destinations. That adversely affected the Cholas who mounted an attack on Srivijaya during the eleventh century.

The Cholas emerged with flying colours in several engagements, and after a protracted warfare eventually contributed to the downfall of the Hindu empires. The Cholas themselves were in no position to step in as they could not maintain a regular supply line from the mainland. The Hindus lacked vision and instead of formulating a long range strategy through mutual co-operation adopted the course of confrontation. The loss of the Hindus was the gain of Muslims. There were other foreign powers waiting in the wings to take full advantage of the chaotic conditions, and they did.

CHAPTER IV

Shipping During the Guptas and Cholas

Soon after the Mauryas disappeared from the scene, the north-west frontier of the country was subjected to considerable pressure from foreign powers. A barbarian tribe called Yueh Chi was driven out from their homes in Kaorsu and Sikiang by the Huns who in turn drove the Sakas. The Sakas descended on India in the first century BC.¹ Though the great Vikramaditya of Ujjain expelled the Sakas in 57 BC, a branch of Yueh Chi settled down in Hindu Kush and continued pressure on the north-west. Known as Kushans, they had an outstanding king in Kanishka who became an ardent supporter of Buddhism whereas his son Huviska championed the Hindu religion.

Prime Minister Nehru was so fond of Kanishka that at the 1948 exhibition of '5000 Years of Indian Art' held in the sprawling halls of Rashtrapati Bhavan, he wanted to see the statue of Kanishka. When this scribe, who was hand-picked by the then Director General Archaeological Survey of India, told him that the piece was mutilated and it was not in good taste to put up the statue of a headless king, he reminiscenced, "It is a powerful piece, the well-built torso covered with a tunic, a long hanging sword..." and added that the Indian official dress (closed-collar coat) has been borrowed from the tunic Kanishka is shown wearing. It is at his instance

that the country today recognises a Sākā era alongwith the Gregorian.

Due to long wars with the Sākās in the first and second centuries AD, the powerful Sātavahanas who tried to restore a central authority, virtually disappeared in the beginning of the third century and a number of minor independent dynasties sprang up². In the midst of all this political confusion, emerged the Gupta Empire in the north when once again India occupied an eminent place in the world and commanded respect from all as testified by the glowing accounts of foreign travellers. The Gupta emperors tried their best to consolidate all the petty kingdoms in the north and bring them under the banner of a central authority. It was during their reign that arts, sciences, trade, commerce etc reached a high stage of development. The Age was marked by an unprecedented outburst of creativity in numerous fields.

The credit for keeping the Hūns and other foreign ferocious tribes at bay goes to the untiring efforts and alertness of the Imperial Guptas.³ In spite of fighting for three hundred years, the barbarians failed to secure a foot-hold on the Indian soil and were driven off to the West. That changed the course of history. Whereas the Hūns and their Turānian allies uprooted the civilization of Central Europe and pulled down the mighty Roman Empire, they could not overrun India. As a consequence, the cultures of India and China were saved and the wrath of the Hūns and their successors fell on the European countries.

Commerce and Shipping

The collapse of Roman Empire adversely affected their trade with India and diverted the attention of Indian

merchants to new markets in South-east Asia and Far East. But trade with West Asia continued as before. Thus the western and eastern coasts “were studded with ports throbbing with trade.”⁴ Ptolemy recounts several ports in what he calls ‘Maisolia’, that is, the region between the deltas of rivers *Godavari* and *Krishna* and states that one of the ports was the starting point of ships bound for ‘Golden Chryse’, the Malay Peninsula. Among major ports on the eastern coast, in the north was Tāmralipti (Tāmluk) and in south Supatna (Madras).

Silappadhikaram also mentions Colchi or Korkai in the southernmost portion noted for “excellent pearl fisheries”. Later, the sea retired from Korkai and Kayal (Coil of Marco Polo, perhaps Nagercoil) became the port. In the west, “Baryagaza (Broach) was the most northern port, Suppara (Sopara) the most ancient, and Calliena (Kalyan), the largest.”⁵ They exported a large variety of merchandise including cloth, ivory, indigo, sandalwood, aloewood, aromatic grasses, medicinal plants and all types of spices to Mediterranean and West Asian ports. The imports were mainly luxuries like wine, unguents, glass, storax, very fine cloth and sweet cloves. In addition, silk was imported from China, ivory from Ethiopia and horses from Arab and Iran.

The large number of guilds set up during the reign of Mauryas were further expanded and streamlined. Each guild had an alderman (*sethi*) and had his own office or Guildhall (*nigamasabha*). It acted as a regular bank in the Classical Age of Guptas and transacted regular banking business of receiving deposits and lending advances. These guilds were major institutions of production and commercial enterprise and enjoyed good influence in the government. Each important city had a manufacturing centre and a council which

included President of the City Corporation, chief representative of the Guild of Merchants, a representative of the artisans, and the Chief Scribe.⁶ Obviously, in the deliberations of the city councils, commercial interests predominated and the representative of the trade had a powerful voice. There were inter-and intra-guild contracts and various types of agreements to carry out commercial activities. Such arrangements had the force of law and were recognised by the government. They were seldom dishonoured avoiding any reference to authorities to resolve disputes.

The guilds were generally very powerful and also wealthy. They jointly bought raw materials, ran factories to manufacture goods, agreed upon a selling price which was honoured by the members, financed trade expeditions and quite a few of them owned at least one or more ships to carry on overseas trade. There was a 'common market' of sorts which fetched good profit. Being religious minded, they donated a portion of the profits to temples or the *Sangha*, as the case might be.

We do not know about the temples but the Buddhist Sanghas having grown rich through contributions made by merchants, and also royal munificence when lands were allotted to them, started participating in trade. They let out land on rent, advanced money on interest and shared profits earned by the expedition. In a number of Jātaka stories, it is mentioned that the Buddhist monks and missionaries went abroad on board a merchantship, ostensibly to carry out religious activities but perhaps also to keep an eye on their commercial interests.

In industry, textile manufacture was by far the most important. There were textile factories in Gujarat in the west, Bengal in the east and Tamil Nadu in the south. In fact, more

or less, most of the Indian states were engaged in the industry. Silk, linen, calico, wool, cotton etc. were produced in great quantities. Other crafts included gold and silver ornaments, gems and pearls, ivory, wood and stone carving; metal articles; cutting, polishing and finishing of precious and semi-precious stones like jasper, agate, carnelian, quartz, lapis lazuli, diamonds, sapphires, and so on. Most of the industrial products were in great demand in foreign countries like Persia, Egypt, Mesopotamia, Greece, Italy and Central European countries.

Samudragupta, who took over from his father Chandragupta in 335 AD, by a series of military campaigns brought under imperial sway, a portion of south India. He marched along the eastern coast and in joint operation with his navy conquered Mahendra of Pithapuram and Vishnugopa of Kanchi. He conquered four northern kings; nine kings of Aryavarta (western half of Gangetic plain) were 'violently uprooted'; kings of the south, east, west and central India were forced to pay tribute; nine republics in Rajasthan were forced to accept his suzerainty. In addition, "foreign kings, such as the *Daivaputra Shahanushahi* ('Descendant of the Son of Heaven, King of Kings', clearly a Kushān title), the Sākās, and the King of Ceylon also paid tribute."⁷

Sridharan quotes R.C. Majumdar who says "although there is no proof of this, we know that many islands in the Indian Ocean were either conquered by the great Gupta monarch, or submitted to him out of fear, thus clearly indicating his possession of a powerful navy." The Allahabad *prasasti* also refers to his conquest of several islands. The fact remains that Samudragupta was a great conqueror, possessed a powerful navy and was inspired with the ambition of establishing a unified authority in India.

Scientific Input

During the reign of the Guptas, India rose to new heights of excellence in literature and sciences. In literature, the Sanskrit drama reached its zenith. There were many playwrights and litterateurs of whom Kalidāsa was certainly the peer and is credited with forty-one works. His *Shākuntala* and *Meghadoota* ('*The Cloud Messenger*') have earned great praise from poets like Goethe. For us, of special interest, is his *Raghuvamsa* which is replete with references to ships and boats. It also mentions that "the Hindu compass was an iron fish (*matsya yantra*) that floated in a vessel of oil and pointed to the north."⁸ Jacques de Vitry in his *History of the Kingdom of Jerusalem* (C 1218 AD) refers to the use of 'compass' in India. An Arabic manual (C 1252 AD) is more accurate when it says that Indian seamen steered by an iron fish, floating in a bowl of oil. The *Mahābhārata* as read today was recast and expanded and refers to several sea voyages.

Indian mathematicians laid the base of trigonometry and *Bija Ganita* (algebra) much before the Greeks knew about it. The decimal system was in regular use among Indian astronomers since the fifth century. The exact date of Aryabhata is not certain—he is said to have lived in the fifth or sixth century—but Romila Thapar says it was in 499 AD that he became the first astronomer to pose the fundamental problems of astronomy. He developed the theory of the rotation of the earth as well as that of epicycles, centuries before it was discovered in the West. "It was largely through his efforts that astronomy was recognised as a separate discipline from mathematics"⁹ He accurately calculated π to four decimal places as 3.1416 and length of the solar year as 365.3586805 days "both remarkably close to recent estimates."¹⁰ He also correctly found out the causes of eclipse.

Aryabhata was not the first astronomer-mathematician and the major exposition of Indian astronomy was done “in the last few centuries before Christ,”¹¹ as recorded in the *Jyotisha Vedānga* and *Surya-prajnapati*. Varahamihira was his contemporary and divided astronomy into three branches: astronomy and mathematics, horoscopy, and astrology. Other mathematicians who followed Aryabhata included Bhaskara I and Brahmagupta (seventh century), Mahavira (ninth century), Aryabhata II (twelfth century). Many of them were well versed in astronomy also. In fact for quite some time, both disciplines were considered complementary to each other and were studied together. Aryabhata’s greatest work *Aryabhatiya* is in four sections, one on mathematics and the other three on astronomy.

Eighteen Siddhantas

There are said to be eighteen *Siddhāntās* or Indian astronomical works. Varahamihira in his *Pancasiddhāntika* has given a concise account of five *Siddhāntās* - *Saura* or *Surya*, *Vasistha*, *Paulisa*, *Romaka* and *Paitamāha*. Among these, the *Suryasiddhānta* occupies the pride of place. Its date is uncertain and in its present form, it “contains different layers of astronomical ideas, some of them very old and others comparatively recent.”¹² The topics with which it deals, will show, of what immense value its contents would have been to the navigators. Till then for millenniums, the profession of sailors was empirical. It was based on keen observation and trial-and-error methodology.

Indian mathematics/astronomy was a major breakthrough and provided the essential scientific input. The knowledge of astronomy helped the sailors to fix the direction of their destination more accurately and estimate distances between two points. Till the middle of fifteenth century, most of the

Europeans believed that Africa was one with Arabia and even India. We reproduce here certain earlier 'maps' of the world to show how far we have advanced since then. (See Maps V & VI). The foundation of such studies was laid by Indian scientists like Aryabhata and Varahamihira.

The *Siddhānta* also mentions methods of calculating meridians, equinoxes, solstices, planetary motions, inclination of the *naksatras* to the ecliptic, heliacal risings and settings of stars and the relative motions of the moon and the sun.¹³ This is the type of information which is required for devising an instrument like *astrolabe*. The *Siddhānta* also gives details of some astronomical instruments and calendar computations. "While some of the astronomical ideas are related to Alexandrian or Greek sources, in the text, there are also ideas which are characteristically Indian."¹⁴

It is only recently that the contribution of India to various sciences—which climbed dizzy heights during the Classical Age of the Guptas—is being acknowledged by western scholars and scientists. The ignorance about the Orient is so widespread and so well-ingrained that when some western chemists came across the preparation of alkalis in the *Susruta - samhita*, they put it down as a later interpolation after the Indians came in contact with European chemists.¹⁵ The well-known Cambridge Professor, Joseph Needham, quotes Filliozat who says: "Only a profound study of Indian scientific developments in parallel with those which took place elsewhere about the same times can reveal the degree of originality of that science and hence enable us to understand the role which India played in the history of the growth of man's knowledge of nature."¹⁶

Missed Opportunities

Where Indians lagged behind was in the practical application of their theoretical scientific knowledge. When Susruta had devised more than hundred surgical instruments, why could not Indian sailors think of developing some navigational tools? They knew before Kalidāsa that an iron fish floating on oil, points towards the north, but did not go a few steps further to attempt construction of a compass. The *Surya-siddhānta* provided to them all the basic information about the movement of planets, meridians, heliacal rising and setting of stars but it was left to the Arabs to incorporate that information on a handy three-in-one piece of *astrolabe* which could be conveniently carried on board a ship and the directions fixed on high seas by adjusting rotating disks.

With the practical application of scientific principles, availability of all the shipbuilding materials in the country and expertise in constructing a ship with the best timber, the toughest cordage, and the finest gums and resins for caulking, the Hindus could have easily rounded the Cape of Good Hope as early as the seventh or the eighth century. That would have enabled them to take their merchandise directly to the doors of European buyers, but they always waited for the buyers to knock at their doors.

They knew that the Geonese, Venetians, Goths, Spaniards, and others were all looking for Indian spices and other merchandise. They must have also known that the West Asian land and sea routes had been blocked for Europeans by the Turks in 1453 AD and they were looking for an alternate oversea route. There were many merchant guilds of means and experience who could have sat down to take stock of the situation and seek a solution. That they

concentrated on Southeast Asian trade is not enough explanation for their neglecting the thriving European market. The Roman trade had declined, the Greeks had withdrawn in their shell and the Arab middle men were not so helpful to meet their requirements.

If there was an attempt at long-term planning, the merchants of the eastern coast could have concentrated on Southeast Asian trade and those of the western coast and Gujarat on the European market. Both could have joined hands to finance expeditions and equitably shared the profits according to their financial commitment and involvement. We cannot get away by putting all the blame on the absence of royal patronage, political chaos and lack of a central authority after the Guptas had declined.

During his forty-one year rule (606-647 AD), Harsha did try to weld various small kingdoms in north India and bring them all under the banner of a unified control. But the times had changed and it was not possible to repeat it in Asoka the Great or emperor Samudragupta. The pattern that emerged was to respect the independence of various kingdoms and be satisfied with their accepting the suzerainty of Harsha who commanded great respect and exhibited enormous personal charm. His feudatories included Nepal and he was on the best of relations with China. His contemporary T'ang emperor, Tai Tsung, sent an embassy to his court in 643 and again in 647 which reached when he had just passed away. But he did not encourage his people to seek their fortunes in the West which was not unknown.

The Mauryas had efficiently organised the shipping industry and streamlined port management. The Guptas had supplied the scientific input. The knowledge of mathematics and astronomy was of infinite help in directing the ships to

the desired destination. The Monsoons were there to take them across the Arabian Sea and the Indian Ocean. Indians were already familiar with the eastern coast of Africa, and some speculate that they might have gone to the west coast as well. But the Indians lacked the vision and the will to take the initiative in nursing Europe. Prof Needham thinks that Indians were full of an adventurous spirit which they displayed in plenty in the south-eastern waters. Their neglect of the West changed the course of history and compelled European nations to find a seaway for the Indies.

Impact on Arabs

Hitti, the well-known authority on the history of Arabs, says "India acted as an early source of inspiration, specially in wisdom, literature and mathematics."¹⁷ Siddiqi adds, "The Arabs achieved remarkable progress in maritime trade, knowledge of geography and chemistry by virtue of their study of Indian astronomy and mathematics. They had a division of the *ecliptic* into twenty-seven or twenty-eight parts suggested evidently by the moon's period in days. And it was certainly borrowed by the Arabs from Indians."¹⁸

An Indian merchant introduced into Baghdad, the Indian treatise on astronomy by Brahmagupta in 771 AD.¹⁹ Brahmagupta was an accredited astronomer not only in India but also in Arabia.²⁰ The *Brahma-sphuta-siddhānta* was translated by Mohammed ibn Ibrahim al-Fazāri and called as *Sindhind*. The other treatise, *Khandakhādya* was translated by Yaqub ibn Tāriq and is known in the Arab world as *Arkand*.²¹ The translations, says Hitti, were completed between 796 and 806 AD, and al-Fazāri became the first astronomer in Islam."²² Both produced a deep impact upon the astronomical thinking of Arabs. Later, al-Khwārizmī prepared an abridged version of *Sindhind*. The same Hindu

traveller brought another treatise on mathematics which introduced the concept of numerals, and that of zero, in West Asia. Zero is the corner-stone on which rests the entire mathematics and many philosophical ideas. In recognition of the Indian initiative in this regard, the Arabs call mathematics as *Hindisa*, i.e. pertaining to India. A mathematician or an engineer in Arabic is referred to as *muhandi*—an expert in mathematics.

Brahmagupta gave a formula for the sum of a n terms of the Arithmetic progression of which the first term is unity and the common difference in unity²³. He formulated rules to find out the area of cyclic quadrilateral “and the length of the two diagonals of cyclic quadrilateral which are still in use.”²⁴. These should have been of great use to navigators in fixing directions with the help of certain constellations. Bhaskara II dealt with the problem of arithmetic, geometry and algebra in two parts—*Lilāvati* and *Bījagānita* of his famous work *Siddhantasīromani*. Some scholars think that Bhaskara almost hit upon the root idea of the differential calculus but was unable to evolve the modern notions which owe their development to Newton (1642-1727) and Leibnitz (1646-1716). It is not known whether the works of the other Indian mathematicians like Brahmagupta, Bhaskara, II, Mahavira’s *Ganitāsarsangraha*, Aryabhata II’s *Mahāsiddhāna* and Sridhara’s *Ganitatilaka* were also translated into Arabic.²⁵

Caliph al-Mamūn (813-33) set up the great translation bureau - *Baitul Hikmat* (‘House of Wisdom’) at Baghdad.²⁶ It was a combination of a library, an academy and a translation bureau - all under one roof. He invited scholars of Sanskrit, Greek and Latin who helped in accurate translations. The Arab scholars not merely carried out transla-

tions but wherever possible made their own contribution and enriched the existing knowledge on a subject. For example, al-Fazārī compiled *Kitab-uz-Zij* (tables) in the second half of the eighth century.²⁷ The Arabs had the advantage of having close interaction not only with the Indians but also with the Persians and Greeks, and from every source they learnt whatever they could. At the same time they freely acknowledged the debt of India in building up the base of some seminal subjects.

Ibn Majid's Fawa'id

Within hundred years of the establishment of *Baitul Hikmat*, a large number of significant works on various subjects in Sanskrit, Greek, Latin had been translated, learnt and digested by the Arabs. In the ninth century "learned men in the schools of Cardoba in Spain were corresponding with the learned men in Cairo, Baghdad, Bokhara and Samarkand".²⁸ The Arabs travelled extensively by sea and meticulously kept the record of their voyages which the Hindu merchants/explorers seldom did or, if they did, their records were destroyed during devastating invasions by Muslims like Mahmud of Ghazni.

If we skip a few centuries, we find that in 1489-90 Ibn Majid wrote a remarkable book on navigation. He was a prolific writer and has about forty books to his credit, most of them on navigation and practically all are in verse -G.R. Tibbetts gives a list of all his works in his book on *Arab Navigation in the Indian Ocean Before the Coming of the Portuguese* which is a translation of *Kitab al-Fawa'id* of Ahmed Ibn Majid al-Najdi - his full name - and perhaps one of his rare works in prose. The book in four volumes is profusely annotated by Tibbetts and contains very useful information.²⁹

Could this learned man be the same Ibn Majid who is credited - or discredited - with showing to Vasco da Gama, the ocean route from Malindi in Africa to the west coast of India? Ferrand gives various names of pilots who guided him across the Indian Ocean. These are Malemo Cana, Malemo Canaqua etc which could be nicknames or titles; the actual name of the pilot is not given. *Malemo* is the Arabic *Muallim* which means a pilot and Cana or Canaqua is the Indian *Kanaka* or an astrologer.³⁰ Except for Vasco da Gama, all Portuguese sailors refer to their guide as the Moor of Gujarat, that is a Gujarati Muslim, whereas Ibn Majid was an Arab descending from the Bedouin blood of the Najdi highlands.

In his Leningrad poem, Ibn Majid “bewails the arrival of the Portuguese.” Tibbetts after discussing at length the identity of the pilot comes to the conclusion, “It is much more likely that the pilot of Vasco da Gama was an Indian stranded in Africa, hoping to earn his passage back to his native land than an Arab of Ibn Majid’s knowledge who would have realised the consequences of introducing the cursed Franks into Indian Ocean trade.”³¹

In describing the qualifications a *muallim* (pilot) should possess, Ibn Majid, Mahri and other Arab writers include almost all the qualities mentioned in the *Jātakamala* of Arya Surā written probably in the first century AD. In praising the Boddhisatva as a perfect pilot, the *Jātakamala* states:

He “possessed every quality desired in such a one. Knowing the course of celestial luminaries, he was never at a loss with respect to the regions of the ship, being perfectly acquainted with the different prognostics, the permanent, the occasional and the miraculous ones; he was skilled in the establishment of a given time as

proper or improper, by means of manifold marks observing the fishes, birds, rocks etc; he knew how to ascertain rightly the parts of the sea; further he was vigilant, not subject to drowsiness and sleep, capable of enduring the fatigue of cold, heat, rain and the like, careful and patient. So being skilled in the art of taking a ship out and bringing her home, he exercised the profession of one who conducts the merchants by sea to their destination.”³²

It is not known whether the Arab writers had gone through the text of *Arya Surā* but if it is coincidental, then it is indeed a wonderful coincidence. Ibn Majid does not mention any Indian book on navigation, but is not found wanting in acknowledging that he did come across quite useful information on the subject from Indians. Tibbetts points out: “Not only does he draw on the experience of his fellow countrymen but also continually mentions the practical results followed by navigators of Gujarat, Konkan, Coromandal and sometimes other places...”³³

Advent of Islam

With the advent of Islam, the West Asian region received a new vigour. The greatest contribution of Mohammed was to unite the scattered ferocious tribes of Arabia and bind them together “with religion rather than blood as its basis.”³⁴ Already the two great religions of Judaism and Christianity had appeared on the scene. Both preached one God. The Hindus were notorious as worshippers of many gods and goddesses but very few appreciated that these were regarded by most of the Hindus as the manifestation of a single God. An idol was devised to help in concentrating on one divine object. Mohammed was born in 571 AD and started preaching only after forty years of age. His religion enjoys the beauty of simplicity.

The faith spread like wild fire and within his life-time, the new religion superseded Judaism and Christianity in vast areas. The sense of unity and the zeal to propagate Islam infused the followers with religious fervour which at times bordered on fanaticism. "The Arab conquest of half the known world within a period of fifty years (670: conquest of Persia; 711: conquest of Spain) is one of the most remarkable chapters in the history of the world."³⁵

When the Arabs overran most of the Mediterranean islands, North Africa and Spain, it would have been surprising if during their heyday, they did not think of subjugating India - a country known to them for millenniums as the richest of them all. They did lead an expedition "by land and sea" says Nadvi, during the days of Caliph Uthmān (644-56) but it was no more than mere raids on Thana, Bhroach and Thatta. In 710 AD, Mohammed ibn-Qasim, son-in-law of al-Hajaj, advanced to India with 7000 Syrians and subdued Makrān, pushed through Baluchistan and in 711-12 AD reduced Sind, the lower delta of the *Indus*.³⁶ In 713 he advanced as far as Multan, and no further.

Another version is that some Muslim refugees were being evacuated from Ceylon to Iraq when some Indian pirates waylaid them off the coast of Sind. To avenge this act, the governor of Iraq, Hajaj, persuaded the Caliph to send a naval force which was mounted from Oman.³⁷ As it approached Debal port of Sind, it was routed by Dahar, the king of Sind. In 756 the Arabs again invaded Sind by sea which was repulsed by the Saindhava chief, Pushyadeva of Jayadratha dynasty. The last attempt was made by the Arabs in 776 when the naval onslaught was conclusively crushed and after that "the Arabs never dared to attack India by sea".³⁸

The naval supremacy of the Saindhavas on the western sea was firmly established and he bore the title of *apara samudradhipati* i.e. 'Master of the Western Seas!'³⁹ Majumdar remarks: "The credit of saving India from Arab invasion by sea justly belongs to the Saindhavas, who are chiefly remarkable as being one of the few powers in ancient India with a distinguished record of naval exploits."⁴⁰ No further effort was made by the Arabs to conquer India for the next 250 years, during the days of the Caliphs when the Islamic power was at its height.

The point to note is that when the followers of Islam during the seventh and the eighth centuries overran the Mediterranean islands, subjugated North Africa, performed a military feat in Spain and knocked at the door of France, in India, inspite of repeated attempts, they could not go farther than Sind. In the tenth century, the Turks had acquired a vast empire and managed to enter India.

With that begins the period of Sultanates with Kutbuddin in the eighth century, and lasting till the fourteenth century. It may be regarded as insignificant and uneventful for Indian shipping. There were Qutbis, Khiljis, Tughlaks and Sayyads. Of the twenty-six Turks who sat on the throne of Delhi, not many deserve special mention.⁴¹ Some Sultans however, possessed a fleet of river boats called *bahr*.⁴² They seldom tried to examine the possibility and potentiality of international maritime trade.

South India

When North India and Deccan - and occasionally a portion of the South - was being ravaged by the Sultans of Delhi, South India kept the flag of Indian shipping flying. In Bengal and Orissa in the east, and Gujarat in the west,

maritime trade continued. In the south, the Cholas had some remarkable naval achievements since the tenth century AD. About the same time, i.e. around the tenth or eleventh century, two very important works, both in Sanskrit, were written/compiled by Raja Bhoja of Dhara—one was an exhaustive book on the art of shipbuilding called *Yuktikalpataru*, giving 25 types of ships which were being constructed in India, and the other was *Samarāṅgana Sūtradhāra*, a comprehensive vital work on the art of architecture and town planning.

The latter book of 662 pages carries one chapter entitled *Yantra Vidhāna* explaining the basis of making a vast variety of instruments.⁴³ Suffice here to quote what Nicolo Conti—who visited India in the early fifteenth century—has to say about Indian ships he saw: ‘The natives of India built ships larger than ours,’ says Conti, ‘capable of containing 2000 butts with five sails and as many masts. The lower part is constructed with triple planks in order to withstand the force of tempest to which they are exposed. Some ships are so built in compartments,’ he continues ‘that should one part be shattered, the other remaining portions may accomplish the entire journey.’⁴⁴

There is enough evidence to show that the south Indian kings belonging to Chola, Chera, Pallava dynasties were keenly interested in shipping from the first century BC/AD if not earlier. There is a Tamil proverb which says that ‘one has to accumulate wealth by crossing the sea (*Tirai kadal odium tiraviyam tendu*).’⁴⁵ Inscriptions found in Ceylon and Takua-pa in Thailand mention names of Tamil merchant guilds. On the main tower of a famous temple of the seventh/eighth century called Tōṇiappar at Srikali, a coastal town twelve km from the port city of Poompuhar, has a sculptural specimen of a *toni*, that is a seagoing vessel, with a clear

visible structure of a rudder and side planks. Many more *toni* representations are on pillars, and paintings of *tonis* on inside wall. That proves the popularity of sea-going *tonis* in Tamil Nadu.

In 1955, the Waikato Scientific Association examined the wreckage of an ancient ship on the Ruapuke Beach near Raglan, New Zealand. It was built of teak and should have been therefore an Indian vessel at least five hundred years old. The bell of the ship had been discovered earlier in 1836 in a Maori kitchen by a missionary explorer. The bell carries a brief inscription in Tamil which reads: "The Bell of Moha Din Bukh's ship" and is now in the Dominion Museum, Wellington. The master's name may be associated with the Marakkaiyar, a seafaring people formerly Hindu but later converted to Islam. The Marakkaiyar was a captain in the time of Zamorin of Calicut and had inflicted defeat on the Portuguese navy.

The Chola Navy

A number of Tamil kings like Rajaraja I, Rajendra I and II, Kulōtunga I and Parantaka maintained strong navies and acquired sovereign rights over a number of Indian Ocean countries. About seventy per cent of epigraphical records clearly testify to the strength of their sea power. The lines *alai kadal naduvil pala kalan cheluthia* (one who has sailed various vessels in the mid-ocean) and *kāudalūr sālai kalamaruthu aruli* (who destroyed the ships at Kantalur sālai) are some of the Chola inscriptions which can be cited in support.⁴⁶

The southern portion of Kerala was ruled by Chera kings. It is mentioned in *Sangam* literature that the ships of foreigners were afraid of coming to west coast area because

the ships of Kerala kings, as well as those maintained by the pirates, were more powerful. After the thirteenth century, Quilon, Cochin and Calicut ports became more powerful whereas earlier, Muziris, Thondy, Bacare, Nelcynda, Naura, Vakai and Pautar were more important.

The Cholas rose to imperial position after their successful engagements with the Rashtrakutas and the Chālukyas and for over two hundred years kept the entire country united south of the *Tungabhadra* river. Rājarāja I ascended the throne in 985 AD and the Tanjore inscription of his twenty-ninth regnal year mentions his victories in its 'historical introduction.' "He was pleased to destroy the ships (at) Kāandalūr Sālai...conquered Īlamandalam (which was the country) of the Singhalas who possessed rough strength the seven and a half *lakshas* of Irattapādi and twelve thousand ancient islands of the sea."⁴⁷

Rājarāja ruled for twenty-seven long years and appointed his son, Rajendra I, as Yuvarāja in the year 1012 AD whose reign extended upto 1044 AD. Rajendra was the great son of a great father and vigorously continued his policy of conquests. He retrieved the beautiful crown and the necklace which a Pandyan King had kept with the king of Īlam, and took away his own crown.⁴⁸ His greatest overseas conquest were that of Kadāram and capture of Srivijaya, ancient Malaiyūr between Srivijaya and Ponnai, Māyirudingam near Ligor, Māppappālam near the isthmus of Kra, Mādamālingam near the Bay of Bandon and Talaitakkolam identified as Takkola near the isthmus. He also took over other important places on sea-lanes as well as the Nicobar islands.

It appears that the main objective of Rajendra was to consolidate his increasing trade with China and any hindrance which came in the way of China-bound ships had to

be removed. In the bargain, he helped in the disintegration of Hindu kingdoms in Southeast Asia region. Instead of following a policy of cooperation with Srivijaya and Shailendras and, like a wise statesman, settling at some understanding with them, he chose the path of confrontation. The long-established powerful kingdoms were destroyed and he or his successors could not keep control over the distant lands. Thus, eventually the strategic sealandes through which most of the trade passed were lost to India.

During the reign of Rājarāja the Great and his able successor, the Malabar and Coromandal coasts were under their control and the Bay of Bengal was turned into a Chola lake. But there are not enough records—except the elaborate *prasastis* giving a long list of conquests—to throw light on their naval technology or warfare strategy. Some scholars are of the view that his entire army was transported to Southeast region on merchant vessels and that “Chola naval fights were land battles fought on the decks of ships.”

The story of the Vijayanagar Empire is the last glorious chapter in the history of independent Hindu kingdoms in South India which was raised on the ashes of the Bahmani rule. The unity of South India became a reality under two great brothers, Harihar I and Bukka. Originally, they are said to have been the officers of the Kakateyas or Hoysalas but founded in 1336, the new state of Vijayanagar.⁴⁹ The empire that they founded continued for over three hundred years and succeeded in keeping the Muslim Sultans at bay.

South India under the Vijayanagar emperors attained unprecedented prosperity as testified by Muslim and Portuguese records. “There were no less than three hundred ports carrying on maritime commerce, and regular trade was

maintained with Persia and the countries in the West.”⁵⁰ Much of the prosperity of the Portuguese in the early stages of their arrival was due to the political support and commercial encouragement extended to them by the Vijayanagar Empire.

CHAPTER V

Portuguese Enter the Indian Ocean

The foundation of world shipping as we know today was laid by the Portuguese. They were pioneers in taking up the study of navigation systematically on scientific lines. Their contribution to the art of shipping is unparalleled and they have many firsts to their credit. The modern mariners owe a lot to their original work in areas like chart and map-making, popularisation of north-south sailings and designing of several nautical instruments. Their entry into the Indian Ocean however was like a bull in a China shop, or still worse. They created havoc all along the Indian coasts and completely altered the pattern of maritime trade. The Indians were able to harass them throughout their brief stay but none was capable of taking the bull by the horns.

In spite of remaining in eastern waters for over a hundred and fifty years, they could secure only a few toe-holds on the western coast which they pompously called as 'Portuguese India' or 'Portuguese Overseas Empire in India.' To be fair, we need not judge their fifteenth century activities with the twentieth century standards. We have to take note of the times they were living in and the state of civilization in Europe as a whole which, barring a few oases, was an extensive sand of semi-barbarism. The Portuguese in India carried out the command of their kings and enjoyed the

‘powers’ conferred on them by the totally ‘illegal’ Papal bulls issued by their spiritual heads.

A few points may be mentioned as a preface. One, India even in the fifteenth century served as a powerful magnet which attracted the peoples of Europe. It was for them a mysterious land and the powerful potentates saw the ‘dream’ of discovering an alternate sea-route to India as the earlier ones through West Asia and the Red Sea were blocked by the Muslim Turks. Two, there was a colossal ignorance among the Portuguese about the wealth and wisdom of India. When Vasco da Gama arrived at Calicut and flaunted his ‘valuable presents’ he was told they were not worthy of the Zamorin. Gama when ushered in his presence was stunned to see the Zamorin wearing many pearls of the size of hazelnuts, a diamond of the thickness of a thumb and a jewel of the shape of the heart surrounded with larger ‘hearts’, and all full of rubies.¹ He mistook the Hindu temple as a Christian Church and offered worship. One of his noble mission was to save the souls of the barbaric pagans. Three, he mainly knew about the Indian spices and other merchandise, trading in these commodities he appeared to claim as a monopoly, and he thought he was well within his rights to enforce compliance.

Four, the Portuguese in the initial stages were very naive about the knowledge of simple geography. For a long time they applied the term ‘India’ or ‘Indies’ to all lands lying east of the Mediterranean which were not controlled by the Muslims. It was believed that the river *Nile* divided India from Africa and *Senegal* river of Africa was identified as *Nile* even by Azura, the chronicler of the famous Prince Henry of Portugal.² Five, it is strange but true that till the last decade of the fifteenth century “none of the European

nations, except perhaps the Vikings, had ventured into oceanic navigation.”³ Their maritime adventures were confined to the sheltered seas like those of the Mediterranean, North sea, Red Sea, the Baltic and the coasts of Europe. Only the Hindus, Arabs and the Chinese had developed a tradition of oceanic navigation and of these “the Hindus had the largest share till the end of the thirteenth century.”⁴ Six, the Portuguese have meticulously maintained records of their voyages and other activities, including the ships they set on fire and the men they tortured inspite of their holding Portuguese ‘safe permits’.

Portuguese Contribution

Portuguese were the first to prepare charts and maps which in most cases were based on actual navigation on the sea. They were again the first to lay down latitude determinations along the entire length of the coasts of Africa. For north-south sailings, it was necessary to have some knowledge of spherical trigonometry. This branch of mathematics was also pioneered by the Indians and is explained in one of the *Siddhāntas* shortly after 400 AD. Aryabhata (C 510 AD), says Prof Needham, “was the first to give a special name to the function and to draw up a table of sines of each degree. His contemporary, Varahāmihira, in his *Panca-Siddhāntika* (505 AD) gave formulae which in modern terms would comprise both sines and cosines.”⁵ The Indian works were “taken over by the Arabs and transmitted to Europe.”⁶

The history of Portugal began only in 1095 AD when the country of ‘Portucale’ was given by King Afonso VI of Leas as dowry to his daughter Donna Theresa, at her marriage with a French noble, Count Henry of Bergundy. His son, Afonso Henriques (1114-85) developed the idea of Portuguese nationality and took up the title of the ‘King of

Portugal.' Lisbon, which was in Muslim possession for over four hundred years, was conquered by him in 1147. With that, the maritime character of Portugal began and by the end of the twelfth century, it had as many as 160 ships.

But King Diniz (1279-1325) was the real founder of Portuguese navy. He appointed Manuel Passanha as admiral and took several steps to establish a modern naval force.⁷ He set up a dockyard for making ships and framed detailed regulations to ensure proper functioning. "Naval activities continued under Afonso IV (1325-57) and D. Pedro (1357-67), and Lisbon became the central port for vessels of all kinds."⁸ Great encouragement to the development of Portuguese shipping was extended by King Fernando (1367-83), the last Bergundian ruler, when Portugal possessed an efficient merchant navy. He supported shipbuilding by offering timber at concessional rates, allowed tax-free imports of raw material, gave tax exemption "on purchase and sale of foreign ships" and on goods carried on the first voyage.⁹ In case of a shipwreck, the sufferer enjoyed some privileges provided he built or acquired other ships.

The subject of astronomy received proper attention for the first time in Europe by the Portuguese in the middle of the thirteenth century, or a little earlier. In 1252, *Libros del Saber Astronomia* consolidated the work on astronomical sciences done till then.¹⁰ King Diniz had founded the University of Coimbra in 1290. *Tabulae Astronomicus* compiled geographical and cosmographical data including tables of night hours and for calculating lunar month and solar and planetary years. King Duarte of Portugal wrote *Leal Counselheiro* which explained how to find time at midnight and at morning by observing the 'Little Bear' constellation. But the most significant contribution to nau-

tical sciences was made by Prince Henry, appropriately named the Navigator, and known to the world as Infante Henriques.

Navigation—A Composite Discipline

Navigation is a composite discipline and calls for the coordination of a number of subjects. Some of the essential ones are chart and map making, reading of stars and planets, sound knowledge of mathematics including trigonometry, building of boats and ships, keen observation of the colour of sea water, marine life and flight of birds, and so on. That was the state of affairs during the period of the so-called 'primitive navigation' when modern instruments had not been devised. Most of all, the people at the helm of affairs had to fight mental fossils embedded in the minds of mariners. Henry adopted a total approach to the science of navigation and undertook systematic study of various disciplines under one roof.

Born in 1394, Dom Henry was the third son of King João with his English wife Phippa of Lancaster. As a young lad, his imagination was fired with the dream of discovering an alternative route to the rich land of the 'Indies'. It was acclaimed as the source of pipy pepper and other spices, sweet-scented sandalwood and excellent shipbuilding timbers, precious and semi-precious stones and pearls, highly fine muslin and silk, and even curiosities like peacocks and talking parrots. From the twelfth century onward no banquet was complete without spiced dishes from the Indies.¹¹ In the past, there was no difficulty in obtaining Indian luxuries through the Venetian and Geonese middlemen who mostly bought it from the Arab intermediaries. But from the time of Saladin, who captured Jerusalem from Crusaders in 1187, the trade route through Egypt was successfully blocked by

the Muslims. This vital victory established predominance of Muslims on the Syrian and Egyptian coasts.

Panikkar quotes Hudson who observes: "Spices which became more and more an essential item of European cookery could not be obtained except from India and Indonesia and must come through Persia and Egypt; this indispensable and naturally monopolistic trade came to be the chief bone of contention in the politics of the Levant and was the most powerful single factor in stimulating European expansion in the fifteenth century."¹²

Till then, oriental commodities reached Europe through three routes—the Northern Black Sea route, the Indo-Syrian middle route and Southern Indo-Egyptian route. In 1453 AD, the Turks closed Constantinople, Syria and Egypt, and Europe could not have access to eastern merchandise. These developments made it inevitable for Portugal to break through the monopoly of Venetians and Geonese-particularly when they hiked the price of pepper exorbitantly and outflank the Muslim blockade by rounding the Cape in the south of Africa and reach Indian Ocean.

The historian of Prince Henry, Gomes de Azura, neatly summed up the motives that urged the navigators to undertake the hazardous voyage. The motives, says Mathew, were five: i) to explore the African coast beyond the Cape of Bojador; ii) to find out whether there were Christians in Africa to trade with; iii) to ascertain the number and strength of Muslims; iv) to seek the support of Christian kingdoms, particularly of Priest John against Muslims; and v) to extend Christian faith and "bring to Him all souls that wish to be saved." Thus the motives were political, scientific, economic, military and religious.

Among the prevalent prejudices Prince Henry had to contend with, was one pertaining to the non-navigability of the Atlantic Ocean. Even in the early fifteenth century the Portuguese navigators believed that the water of Atlantic Ocean was boiling hot, that there were strong undercurrents, a league from the shore, that the Atlantic was a “sea bounded by the sea” while others considered it as “a lake with no access to the sea with monsters and dragons guarding its marvellous riches and hence not circumnavigable.”¹³ In brief, the then sailors believed the Atlantic to be a dark and dreary sea and they trembled at the prospects of entering into its waters. The safe limit of navigation in the Atlantic was Cape Non and “one who passed beyond Cape Non will return or not,” none knew with certainty.¹⁴

In the prime of his youth, at the age of 24, Prince Henry left the pomp and power of a Kingdom and retired to the promontory at Sagres and set up there the first school in the world of nautical sciences. It was a unique institution in many respects. At the University of Nalanda and the Baitul Hikmat of Baghdad, a number of subjects were taught. At Nalanda, teaching was imparted mostly by word of mouth and the students developed phenomenal memories. At Baghdad, selected works in Sanskrit, Greek and other languages were translated into Arabic, if possible under the guidance of the masters in the foreign languages. The Hindus and the Arabs both had been sailing from times immemorial. But neither thought of setting up an institution during all these millenniums which will collect and collate all empirical knowledge about navigation and record the experiences of mariners for use by posterity.

It is incumbent for a sailor to maintain a daily diary of his sailings on seas giving details like the rocks and reefs

he encountered, depth of sea at various points even though taken by a lead, the marine life he met on the voyage and other landmarks when hugging the shore. If the sailor did not bother about those who would follow him on the same route, this sort of log book was an essential companion for his own use. I am sure such log books must have been maintained by Indian sailors ever since writing began as borne out by two extant manuscripts in ancient Gujarati called *Ghos ni Pothi* and *Malan ni Pothi*. Either such log books would have been eaten up by white-ants, or destroyed by ruthless raiders, or may be still lying in some dilapidated *havelis* in maritime states awaiting recovery.

In this sphere NISTADS (National Institute of Science, Technology and Development Studies) has been doing remarkable work and we can only hope that, in addition to recording indigenous navigational traditions, their scholars might succeed in laying their hands on some of these priceless 'jewels'. *Ghosi ni Pothi*, for example, contains significant details about rhumb lines, degrees of stars and distance between two rhumbs, location of various ports along a specific sea route, formulae to calculate correct bearings, latitude and longitude of ports on a definite route and even prescription of medicines for sickness on seas.

The nautical school of Henry, like a laser beam, concentrated all light on a single subject of navigation. Information about other disciplines which were relevant to the main subject was also pooled together at Sagres. Some of such disciplines included astronomy, mathematics, geography, cartography, instrumentation, and even shipbuilding. The last in itself is a vast subject involving knowledge about timbers, cordage, gums and resins, carpentry, caulking, to mention a few. Whatever material could be acquired on any

of these or allied subjects, in whatever language from whatever source, was compiled and categorised under the direct supervision of Prince Henry. Knowledgeable scholars in any of these subjects were cordially invited and enjoyed royal patronage. These included Geonese, Venetian, Jew, Catalan and Arab experts.

Mathew does not mention any Indian or Phoenician scholar or navigator at the nautical school of Henry. It may not be an omission but a fact. As far as the Hindus are concerned, at that point of time most of them were fighting for their lives against the atrocities of the Turkish Sultans. Only the Vijayanagar empire South of *Tungabhadra* was in ascendancy. May be, due to demands of diplomacy the Portuguese did not like that the Indians get any wind of what they were up to.

In that case, why did they invite the Arabs - their enemy number one. Perhaps because they had a treasure of books on most of the subjects in original Arabic or in translation, of works in Sanskrit, Greek, Latin. In some cases, the originals had been lost and it was only through the translations in Arabic that the light of knowledge was kept burning. Apart from *Āryabhatīya*, *Pancasiddhāntika* and other treatises of Āryabhata and Varahāmiḥira, the Arabs kept up their work of translating original Sanskrit works.

With a unique collection of books and charts and a galaxy of scholars, Henry devoted all his time in putting navigation on the map of the world. He did not marry and led a life of celibacy and austerity. He settled down at Raposeira between Lagos and Sagres promontory and devoted all his leisure and pleasure to a single end-to find the sea-route to India. The 'Plan of the Indies', to double the

African continent to reach the Indian sea, was first conceived by Prince Henry and then taken up by John II (1481-95) in whose reign charts were prepared in accordance with hydrographical drawings which distinguishes Portuguese cartography from that of others. (See Maps 5 & 6 opposite page 98 reproduced from *VI Reuniao International ACTAS* (p322) showing early attempts at map-making to find a sea route to India).

King Duarte combed copies of translations of Greek and Arab works to help his brother Henry with every bit of relevant information. He went through the works of Al Masudī and Idrīsī and even the travels of Ibn Batuta. Marco Polo's writings were available in Portugal since 1428 and revealed that there must be a passage round the south of Africa. Regent Pedro brought from Venice, an up-to-date map of the world then known. He visited Florence where scholars like Toscanalli were engaged in geographical studies.¹⁵ D. Pedro was convinced that the Muslim world could be outflanked and alliance sought with Christian kings in the East.

The conquest of Ceuta in 1415 on the north coast of Africa across Gibraltar, the Count of which had helped Tariq in defeating King Rodrigues, marked the beginning of the Portuguese maritime enterprises. Ceuta not only secured the gold of Guinea coast but also served as a source to collect information about the East. Henry sent several square-rigged barcas to the Atlantic coast of Morocco and discovered Porto Santo. Madeira was explored in 1420 and the island started sending back to Portugal honey, sugar, wine and hard timber for shipbuilding. After fifteen unsuccessful attempts during 1425-34, sailing beyond the Cape of Bojador, Captain Gil Enes broke an old barrier of superstition. Now the way was

clear for progressive exploration down the African coast. Two years later, after sailing for about 260 miles, Antonio Gongalves Baldia crossed the Tropic of Cancer and explored the mouth of river *Rio de Ouro*.¹⁶ In 1437, an expedition was sent to *Tangiers* to destroy the Muslim domination but it ended in dismal disaster and Prince Fernando died in captivity. In 1441, Henry sent Nuno Tristao further south on the coast of Africa and he discovered Cape Branco. Upto 1446, over fifty caravels reached the last point at the Guinea coast and brought gold dust, salt and slaves.

Needless to say that whatever islands were discovered or the cities captured, they all became the property of the Portuguese kings. A new system of seeking Papal sanction to their possessions gave them a spiritual legitimacy. Much before King Diniz founded the Order of Christ, a Papal Bull issued by Alexander III accorded recognition to a separate state of Portugal. In 1436, the Papal Bull of Eugene IV of 1436 granted Prince Henry exclusive rights over all territories already conquered or those to be discovered beyond the Cape of Bojador. It was like the Buddha or Mahavira sitting in Kapilavastu or Sarnath in India issuing an 'order' that all their followers, kings or commoners, monks or missionaries, whenever they find an island or a country will have the 'sacramental' right to rule over them.

The authority that the church arrogated to itself went on increasing. The Papal Bull of 1443 allowed spiritual jurisdiction of the Order of Christ over all lands to the south and voyages henceforth were to be considered as 'crusades'.¹⁷ Dom Henry, on his part, "did not fail to point out that as a Christian prince, he considered it, his first duty that the heathen peoples of the land discovered should be claimed for Christ."¹⁸ India is clearly mentioned for the first time in

the Bull of Pope Nicholas V - *Romanus Pontifex*, dated 8 January 1455, desiring that Prince Henry should undertake more voyages to the 'Indies'. This shows that by then the Portuguese had firmly decided to round the Cape to reach India.

The Bull of the following year, 1456, conceded spiritual jurisdiction of the Order of Christ over all lands from Cape Nun right up to India.¹⁹ In 1460, Pedro de Cintra reached Sierra Leon, the last point reached during the life-time of Prince Henry. It is indeed a pity that the man who had moved heaven and earth to find an alternate sea route to India and contributed enormously to the systematisation of nautical sciences, could not realise his dream and passed away in 1460 at the age of 67.

Covilhão—First to Reach India

In the year of Prince Henry's passing away, a Venetian friar, Fra Mauro, presented a map to King Afonso tracing the entire eastern coast of Africa. The task left unfinished by Henry was picked up by his nephew, Dom João II who decided to send two expeditions to the East, one by land and the other by sea, almost simultaneously. The overland expedition comprised João Peres de Covilhão, a fidalgo who knew Arabic, and Affonso de Paiva.²⁰ The expedition left Lisbon on 7 May 1487 and both disguised as Arab merchants, reached Aden via Alexandria and Cairo. Leaving Paiva at Aden, Covilhão "embarked for India in a Muslim vessel and after sailing in the Indian sea, he reached Cannanore..."²¹ by the traditional route of Greek and Roman merchants. Thus Covilhão or Covilham became the first Portuguese to set foot on Indian soil. "He stayed for a considerable time both at Cannanore and at Calicut and gathered valuable information about Indian trade."²²

Covilhão's confidential letters to King João II gave basic details on navigation in Indian waters which were of immense help to prospective sailors. One letter which was personally delivered to the king by a reliable messenger explained probably for the first time to the Portuguese, the behaviour of the regular winds blowing over the Indian Ocean. He informed that ships to India should be sent during the months of May to October, and for return journey it was safe to sail between November and April. "If the ships which traded with Guinea," the letter said, "were to continue their course along the coast of Sofala, they would strike in the eastern seas and reach the Calicut coast."²³

Meanwhile, João II fitted out two ships of fifty tons each in 1486 and entrusted them to Bartholomeo Diaz. Diaz "was provided with a table of Sun's declination so that in the southern hemisphere where the Pole Star disappeared over the horizon, he could easily evaluate the latitude."²⁴ He rounded the Cape of Tormentos and King João II recognising the importance of this discovery, renamed it as the Cape of Good Hope. King João "received valuable information about the route to India from the King of Benin during the latter's visit to Portugal in 1484."²⁵

The First Portuguese Roteiro

King Manuel, João's successor, inherited all the wealth of maritime discoveries to which he added his own. It was under his regime (1495-1521) of about twenty-five years that the Portuguese scored a discovery almost every year and "witnessed the climax of maritime triumph."²⁶ He sent secretly, a great navigator, Duarte Pacheco Pereira to discover the Western-region. His account of travels recorded in *Esmeraldo de Situ Orbis* is the earliest dated Portuguese "roteiro" and is available in English translation at St. Xavier

Institute of Historical Research, Goa. *Esmeraldo* is an anagram of Emmanuel (Manuel) and Eduardus (Duarte). Dr George Sheppard, however, thinks that the word is akin to Spanish "*esmerado*" which means guide. The author calls it as "a book of cosmography and navigation" which has followed the example of the Arab writer, Ibn-al-Wadi, of the first half of the fourteenth century.

Whatever that be, the "roteiro" furnishes very useful information. It says that Cabo de Nam and Cabo do Bojador lay North-East by East and South West by West and occupied 60 leagues on the route "but a wise pilot will steer West-South-West for 30 leagues of his voyage and the remaining 30 South-West by West and will thus round Bojador 8 leagues out at sea; he should not take any other course because Cabo do Bojador is most dangerous as a reefy rock runs out into the sea 4 or 5 leagues on which several ships have already been lost through ignorance."^{26a}

Now the prevalent superstition of "no return" who goes to Bojador becomes more meaningful. Pacheco was a great innovator who freed himself "from the shackles of classical and ecclesiastical scholarship and treats experience as his guide."^{26b} He mentions that Ceuta was taken over in July 1415, Alacer in 1458 and Arzila in 1471 AD.^{26c} In Chapter VI he exhaustively deals with "how the longitude and latitude of globe must be taken"^{26d} and gives a map of African coast.

Armed with such details, Manuel 'the Fortunate' under the advice of a Hebrew astronomer, Araham Ben Zakut, specially constructed three ships which could withstand a prolonged voyage providing for all conceivable contingencies on the way with the vast experience of fifty years' of

exploration and information collected systematically on various aspects of the voyage. The command of the armada was entrusted "to an unknown courtier, a fidalgo of his household, Vasco da Gama."²⁷ The da Gamas were a well-known family tracing their descent to a knight. The fleet was different from the earlier caravels. They were smaller by choice, square-rigged on fore and strong enough to carry cannon. They retained the lateen rig for the mizzen.

The flagship *Nau 'S. Gabriel'* (100-120 tons) was commanded by Vasco da Gama - *Nau S. Raphael* (100 tons) by his brother, Paulo da Gama, and the third caravel by Nocolo, an experienced man of several expeditions.²⁸ The fourth vessel was a store ship (200 tons) under a servant of Vasco. The banner was given to Vasco, alongwith letters to Priest John of the Indies and the Zamorin of Calicut. Prayers were offered at the Chapel of Our Lady of Belem on the eve of departure and the vessels cast their moorings on 8 July 1497.

After a voyage of three months, the fleet anchored at the Bay of St. Helena on 4 November where they stored water and took astronomical observations with the *astrolabe* made by Martin Behaim. They doubled the Cape on 22 November with the help of westerly winds, reached Mombasa via Mozambique on 7 April 1498. The ruler of Melinde gave them the services of an experienced Gujarati moor, who could not be Ibn Majid, the well-known Arab and author of nearly forty books on navigation.

Leaving Melinde on 24 April, they sighted land on 17 May and reached Calicut on 17 May 1498 after a non-stop voyage of twenty-three days from Melinde. The journey from Lisbon to Calicut, about 4000 leagues, was completed in 207 days.²⁹ It is a pity that explorers like Covilhã and Diaz who had reached the shore of India much earlier, and

lived there for considerable periods, did not receive the recognition they deserved of discovering the alternate sea route to India. All the thunder was stolen by Vasco da Gama who reached upto Melinde on the east coast of Africa from where he was literally escorted and piloted to India by a Gujarati Muslim. By early sixteenth century, the Italians had prepared a fairly accurate chart of the coasts of west and South Africa as seen in Map VII (original in the British Museum)

India When Vasco Arrived

At the time when Vasco da Gama anchored at Calicut, there was no 'India' as such but a number of petty kingdoms. The Mughals had yet to come and set up an empire. "The Delhi Sultanate was in the last stages of disintegration. The only kingdom which commanded a central authority in the south was that of the Vijayanagar. By then the rulers of this empire had acquired sway over the three main kingdoms of Cheras, Cholas and Pallavas. They were at war with the Deccan and being at the height of their glory, the Portuguese sought every opportunity to befriend them.

Even in South, on the west coast of Malabar from Cannanore to Cape Comorin, there were as many as nine minor rajas of Tanur, Cranganore, Cochin, Mangat, Idappalli, Vadakkumkur, Procaud, Kayamkulam and Quilon. The Zamorin was the wealthiest and the most powerful ruler on the coast. His naval forces were strong enough to scour the coast from Gujarat to Ceylon." Calicut, says Nicolo Conti, was "a noble emporium for the whole of India."⁴³ It had Mohammedans from as far as Ormuz, Cairo, Abyssinia and Tunis.

Ibn Batuta gives the reason for the popularity and prominence of Calicut: "In the lands of Mulaybar, except in

this one land alone, it is the custom that whenever a ship is wrecked, all that is taken from it belongs to the treasury. In Calicut, however, it is retained by its owners and for that reason, Calicut has become a flourishing city and attracts a large number of merchants.”³⁰

On arrival in 1498, Vasco da Gama found that the Indian seas from Madagascar to the Strait of Malacca were practically in possession of the Moslem merchants who owned and managed most of the ships. There were certainly ships owned by the Gujarati, Bengali and Coromondal merchants but the predominance of the Muslim interests was beyond doubt. They never interfered in local politics nor had any political ambitions. Consequently, they enjoyed the protection of the authorities and the entire trade in the Indian Ocean before the advent of the Portuguese was perfectly peaceful.

All this drastically changed on the arrival of the Portuguese who introduced a number of new features in the Indian Ocean shipping. At that time, there was no concept of any country enjoying an Exclusive Economic Zone in the sea lying along its coasts. High seas were free for all, so were the Indian Ocean, Arabian Sea and Bay of Bengal. The Portuguese were the first in the world to claim sovereignty over the Indian seas. On their part, they were armed with Papal Bulls.

The Bull of Nicholas V referred to earlier, added, “We after careful deliberation, and having considered that we have by our apostolic letters conceded to King Affonso, the right, *total and absolute*, to invade, conquer and subject all the countries which are under rule of the enemies of Christ, Saracen or Pagan...”³¹ On 13 March 1456, Calixtus III

promulgated a second Bull confirming the grant of Nicholas V. Henry was thus “able to obtain what in the fifteenth century was an absolute and incontestable legal title...”³²

A number of consequences followed from their misplaced sovereign claim on the Indian waters. They did not allow the vessels of any nation, including Indian people, to sail. They introduced a system of *cartazes*, permits, which every merchant had to obtain from the Portuguese authorities on payment of certain fee. They demanded monopoly rights in the trade of certain Indian commodities on certain routes. The Muslim merchants had to be expelled from Indian shores. According to the foreign intruders, whatever places or ports they occupied became their possessions and the inhabitants of those places, their subjects.

King Manuel had assumed the pompous title of the “Lord of Navigation, Conquest and Trade of Ethiopia, Arabia, Persia and India,”³³ and his captains or representatives exercised the same authority on his behalf. It could be regarded as ridiculous as if King Chandragupta sitting in Pataliputra declares himself to be the *ipso facto* King of Java, Sumatra, Borneo, Celebes, Indo China and wherever the Indians settled down, as the rightful ruler of all the countries!

But that is exactly what the Portuguese did, and for enforcing their ‘sovereignty’ and control they freely used the gun and the sword. Within a short time of their reaching the shores of India, they had acquired a fairly good idea of the state of political disintegration and dissension among the local petty kings. They found out that the only powerful Empire worth the name was that of Vijayanagar and much of “the prosperity of the Portuguese depended on their

commerce with that Empire.”³⁴ The other powerful potentate was the Zamorin of Calicut. They tried to undermine his authority by cultivating friendship with his feudatory, the Raja of Cochin, who did not like to be Zamorin’s subordinate.

To the north of Vijayanagar Empire was the Adilshahi Sultanate of Bijapur founded by Yusuf Adil Khan in 1490, and further north was the powerful Sultanate of Gujarat where after Mahmud Beghara, a Rajput convert Zafar Khan ruled till 1511 AD. In Narasimha Raya of Vijayanagar, Vasco da Gama found a fine friend having the common objective of destroying the Muslim sultanates. He promised to get horses for Vijayanagar and requested him to grant the permission to set up a fort at Bhatkal which ultimately he conceded. Vasco played one raja against the other and succeeded in harassing the Zamorin.

The cartazes were issued from 1502 onwards and carried certain stipulations which included not to carry on board Turks and Abyssinians considered as enemies by the Portuguese; the name of the Captain and owner of the vessel; the capacity of the vessel; its destination etc. had to be registered; the arms and ammunition allowed was strictly limited.³⁵ The cartaz-holder was not allowed to carry ‘prohibited articles’ like spices. The ships carrying cartazes but violating even one condition were confiscated as a prize and the crew sent as slaves to the galley.

Exemptions were made in case of friends. Free cartazes were given to local rulers for political purposes. The Sultan of Bijapur got four cartazes a year, the Sultan of Ormuz, seven. Even Akbar the Great was to obtain a cartaz, and was given one free cartaz a year for a ship to go to Red Sea. The

Zamorin also agreed to purchase cartaz. On the coast of Cambay, the Gujarati merchants were obliged to purchase cartazes and their trade to Red Sea was totally blocked. "Once Bassein was acquired in 1534 and Diu a year later, the Portuguese were able to patrol effectively along the northern coast."³⁶ It is worth analysing that how a nation coming to unknown waters, nearly 4,000 leagues away from home, could dictate terms of trade and shipping to an ancient people in their own seas and on their own lands.

For one thing, the Portuguese were the creatures of their King and enjoyed his full patronage as well as the 'spiritual' sanction of their Pope. Two, they had come fully prepared for any eventuality including naval and land warfare. Three, their ships were constructed for the purpose of waging a war and had guns on board. They were also expert marksmen. Four, the type of tyrannies they were capable of committing were beyond the wildest imagination of civilized Indians.

India, on the other hand, was a divided house. There was no central authority. One raja or prince was ever eager to pull down the other. Moreover, for more than four thousand years, they were used to carry on maritime trade in perfect peace. The Arabs, Romans, Muslims, Indonesians, Chinese etc had been visiting Indian waters and enjoying all facilities that are due to a trader. Indian seas were free for all and none had ever claimed sovereignty over them or monopoly over trade in certain commodities. No attempt was ever made to safeguard sea-lanes or fortify ports. A gun or a cannon on a trading vessel was a rare sight and more of a novelty than the norm. They were used to wars on land but bombardment from the sea was not mentioned in the book.

The fact remains that they did not properly assess and evaluate the danger and lacked the foresight to take time by

the forelock. The emperors of Vijayanagar extended the hand of friendship to the Portuguese instead of patching up with the Muslim Sultans and presenting a common front. The other power which could take on the Portuguese was the Zamorin of Calicut. He failed in his attempts to secure the support of other sovereigns and feudatories to face the common danger. The Raja of Cochin was an ardent admirer of the Portuguese and wrote letters to the King of Portugal swearing his support.

The Zamorin lost precious time in training his people and putting together a fleet with far greater manoeuvrability which like 'wasps' successfully harassed the Portuguese during their entire stay. Chhatrapati Shivaji from the very beginning appreciated the importance of a good navy and caused considerable damage to foreigners' fleet. The Portuguese accepted him as their equal on sea.

Three Periods

The Portuguese period in Indian shipping may be divided into three parts. First was the period of brutal repression, like taming a wild horse. The 'horse' of India in this context was not savage but had to suffer on account of its civility. The purpose was to strike terror in the hearts of an otherwise peace loving sailors and maritime merchants. "...While the entire Chinese operations," says Prof Needham, "were those of a navy paying friendly visits to foreign ports, the Portuguese east of Suez engaged themselves in total war."³⁷ He opines that it was "the settled policy of the Westerners to destroy the Arab-African-Indian trade root and branch."³⁸ He adds, "The records repeatedly say that in many of these sieges (Mombasa, Oja, Brawa, Socotra, Faza, Manda) no living thing was spared... In India the Portuguese behaved in much the same way."

A ship belonging to a brother of Khoja Kassim of Calicut was returning from Mecca. Da Gama stopped it and plundered the goods. Panikkar quotes the admiring author of *Lendas da India* who says, "The Captain-Major after making the ships empty of goods, prohibited any one from taking out of it, any Moor, and then ordered them to set fire to it."³⁹ No pleading, observes Panikkar, "could assuage the thirst of the Portuguese for blood; and though the Moors offered all they possessed, the order was given to set fire. This is a typical example of the inhuman and almost demoniacal cruelty of the Portuguese adventurers..."⁴⁰

When Zamorin sent his representatives to da Gama with proposals to make an agreement, the Captain-Major, according to Barroes, ordered his men "to cut off the hands, the ears, the noses of all the crews and put them all into one of the small vessels in which he ordered them to put the friar (a Brahmin envoy of the Zamorin who came with a Portuguese safe-conduct) also without ears nor nose nor hands, which he ordered to be strung round his neck with a palm leaf for the King on which he told him to have a curry made to eat of what the friar brought him."⁴¹ This is how an ambassador of the King was dealt with by a responsible Portuguese officer, any comment on the barbaric behaviour of the early Portuguese is useless.

The next period is that of consolidation of the Portuguese power. Even commercially, Vasco's voyage was a great success. "The cargo, he brought with him was worth sixty times the cost of the expedition..."⁴² Vasco returned to Portugal and was accorded a hero's welcome when he reached Lisbon on 29 August 1499 after 732 days he left on his epic voyage. He was rewarded with a well deserved prefix of 'Dom',⁴³ awarded the coat of royal arms, the

Admiralty of the Indian Seas and an yearly pension of 3000 *reis*.

Next to come to India was Pedro Alvarez Cabral with a fleet of thirteen ships, says Villiers, but thirty-three ships carrying 1500 men according to Panikkar. "The Portuguese King could not have selected a worse officer if he wanted to establish peaceful relations with the Indian rulers..."⁴⁴ In the Raja of Cochin he found "a docile ally"⁴⁵ and secured the permission to build a factory at Cochin. He also befriended the rajas of Cannanore and Quilon to form a combined front against the Zamorin. Meanwhile, Zamorin also equipped a fleet of about eighty ships manned by 1500 men. "When they were sighted off Cochin, Cabral's courage deserted him"⁴⁶ and he fled at night along with some hostages including a relation of the Raja of Cochin who was presented to King Manuel, and was greatly glorified.

Meanwhile, King Manuel had sent a small fleet of four ships and another squadron of five vessels to find the fate of Cabral. This time, it was a savage and relentless Vasco da Gama. He reiterated his demand to Zamorin to expel the Moors failing which he perpetrated savage brutality upon the people. Zamorin collected a large naval force under Koja Kassim to attack Gama off Cochin. But the Raja of Cochin was softened to pulp by various return gifts he brought from the King of Portugal including two thousand gold cruzados put in a silver cup. In return, he wanted that Raja should allow Captain-Major to buy all pepper, cardamom and other spices at a mutually agreed price and allow Portuguese to build forts and keep garrisons wherever they wished.

Consolidation of Power

The real work of consolidation of Portuguese authority was initiated, and partially accomplished, by Francis de

Almeida who came with the powers of a governor with a lengthy brief from King Manuel. After he had erected ports at Kilwa, Mombassa, Anjediva, Cannanore and Cochin, he became the first Portuguese Viceroy in India and took up the title at Cannanore on 22 October 1505.⁴⁷ Each return-voyage to India took about one and a half years since 1500 AD. It was therefore decided to keep a powerful fleet stationed permanently at some suitable location in India. From that point onwards, ships were to be sent wherever required and the entire coasts of India were to be cruised from Ormuz on Persian Gulf to Kanya Kumari in the Indian Ocean, and further east.

A well-planned naval strategy was devised to control all sea-lanes from Arabia to Ceylon and beyond. Since Almeida failed to conquer Aden, he occupied the island of Socotra to block entry into the Red Sea as far as possible. Ormuz became a vassal port in 1507. The same year another expedition was carried to north at Dabul and Chaul. A year before, the Calicut fleet was routed at Cannanore, they could sail where they wished, but in Indian waters they still had to fight for it.

The Muslim and Indian ships attacked Almeida by a large fleet. But the Portuguese were stronger, abler and had more heavily armed vessels. "They outgunned and outranged both the Hindus and the Moors... and were able to inflict a crushing defeat..."⁴⁸ The Moors then sought the help of an Egyptian fleet under the command of admiral Mir Hussain. In December 1507, the fleet arrived off Diu where it was reinforced by Indian and Muslim vessels. The son of Viceroy, Lourenco de Almeida put up a tough fight but "outnumbered by thirty ships to one", after three days epic battle, his ship sank and Lourenco was dead.⁴⁹ The Viceroy

himself pursued them, Mir Hussain was killed and Diu surrendered.

Almeida set up Portuguese government at Cochin, built a number of ports at strategic locations, established a base off Socotra, entered into a treaty with Ormuz, cruised the entire west coast and extended Portuguese power to Ceylon.”⁵⁰ Lisbon, twelve thousand miles away by sailing route, “had already superseded Venice as the market in Europe for the spices and other products of the East...”⁵¹ On every voyage some new items were added to the long list of royal monopolies. The list of commodities included “pepper, ginger, cinnamon, mace, cloves, nutmeg, worm-wood, borax, camphor, aloes, musk, civet, spikenard, mastic; and precious stones, silks, porcelains, fine raiment.”⁵² Almeida could not complete half the tasks allotted to him, but his contribution to the strengthening of Portuguese shipping and controlling sea-lanes was significant.

Albuquerque's Vision of an Empire

Vasco da Gama's visit to Indian shores could be likened to reconnaissance, that of Almeida to consolidation, but Francesco d' Albuquerque came with a wider vision, to set up an empire. Looking at the map of the region, he must have come to the conclusion that if he wanted to establish supremacy in the Indian Ocean, he should control at least four points: one, at the mouth of Red Sea and Persian Gulf; two, western coast of India from Cambay to Cape Comorin; three, the Cape of Good Hope; and four, the Straits of Malacca.

To achieve his objectives, he should set up a capital, and a chain of ports along the Indian coasts, well-equipped garrisons with sufficient arms and ammunition. The tottering

political structure of India at that period, lack of any central authority, absence of fortifications at ports, running feuds among the petty-minded local rajas, were additional advantages which fell into his lap. The Western Ghats served as a natural barrier and restrained him from penetrating into the interior.

He also suffered from a number of drawbacks. There was poor discipline in his ranks, corruption was rampant from top to bottom, greed for personal gain was uppermost in everybody's mind, arrogance and uncivilized behaviour took its own toll; supply of money, men and materials from Lisbon was irregular and unreliable. Even a man of Albuquerque's calibre could not contend with all these factors. Meanwhile the Zamorin had mended his fences. He employed two Italians, Pero Antonio and Joa Maria to cast cannon for him and teach his soldiers to fire them accurately.⁵³ He went in for smaller vessels which could sting heavier caravels like wasps, but he could not match the Portuguese equipment.

When Greece rose against Persia, all the Greek states as early as in 336 BC formed a confederacy and appointed Philip as Captain-General assuring him full support. When Christians rose against Turkish captors of Jerusalem, all Christian states agreed to a truce in 1095 AD amongst themselves. Nothing of the sort could be organised in India against serious danger to their very existence from a foreign source. Albuquerque took full advantage of such a situation and played with pleasure one ruler against the other.

Albuquerque began with an attack on Ormuz and made it a vassal in 1507. His juniors fought on sharing the booty and complete conquest could be secured only in 1515, the

year of his demise. He organised a raid on Aden but failed to take it. One of his significant achievements was to conquer Goa in 1510 from the Sultan of Bijapur which later became the capital of Portuguese possessions in the East. It had a strategic position and helped him to dominate the Arabian Sea.

He captured Malacca in the following year, 1511, and sent expeditions to explore Indonesia. His emissaries found the famous spice islands of Ternate, Tidore and Ambonia, the source of cloves. "From Malacca, d' Albuquerque was able not only to control trade farther east and to eliminate Moorish middlemen entirely, but he could establish relations with Burma, Siam, Java and Cochin-China. Embassies were sent to each of these countries and Portuguese settled in most of them."⁵⁴ His embassies even travelled to China and finally to Japan. The entire Far East was flushed with wealth. There were ample opportunities and Albuquerque was the first European to have realised the potentialities of the region.

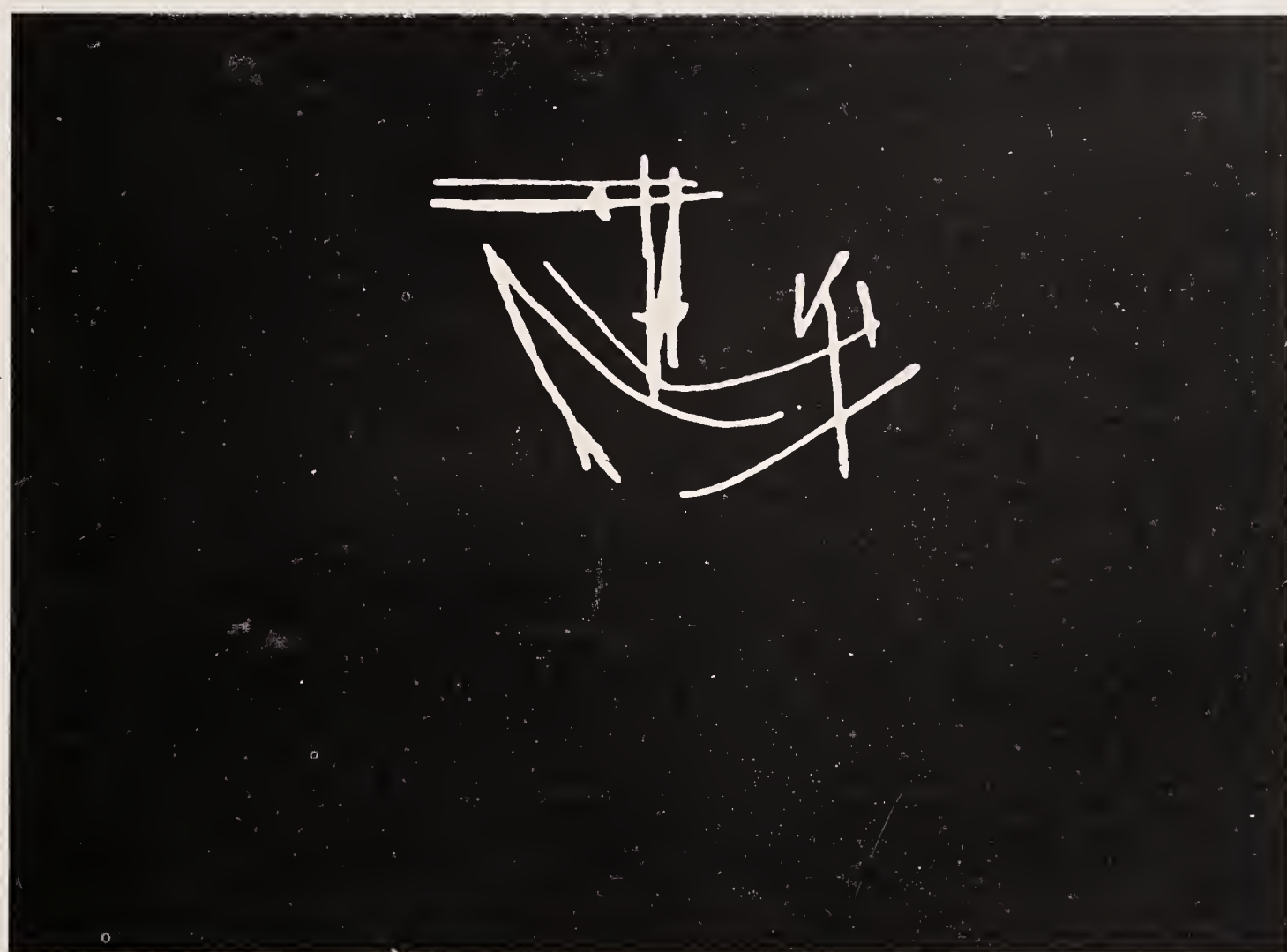
Actuated with the objective of building an overseas empire, his imagination would have flown far beyond examining the possibilities of a maritime trade. As Villiers puts it, "The wealth of the fabulous East was intoxicating."⁵⁵ But he could not get adequate support from his own people. Patriotism is a rare commodity. It is sadly surprising that even today people do not appreciate that in the health and prosperity of the whole, lies the prosperity of the constituent parts. Conversely, if each individual of a nation is only intent on lining his own pocket at any cost, it will emaciate the whole and eventually make a hole in his own pocket.

In case of Portuguese, each fidalgo was carrying on personal trade on the sly and wanted to earn the maximum

profit in the minimum time. They did not only compete with the Asian merchants of all hues but also amongst themselves. Even the highest officer was involved in this race for riches. All said and done, the fact remains that “under the guiding genius of Affonso d’ Albuquerque, its (Portugal’s) great plans prospered and it was able to dominate, from a far away speck of storm-lashed land, the vast domain of the Indian Ocean and the infinite wealth of the wonderful East.”⁵⁶ It was under Albuquerque that Portuguese shipbuilding activity was taken up in India. The “most highly organised naval enterprise”⁵⁷ was at Goa which provided for other peripheral facilities like a mint (*casa da Moeda*)’ a gun foundry (*artilharia*) and an ammunition and gunpowder factory.

Among others who followed Albuquerque, Góvornor João de Castro who came in 1545, was the greatest of all the rulers. The defence of Goa by Viceroy Luis de Athiade from the attack of Muslim powers in 1570 was a great achievement. But the large fleet of 36 vessels, he despatched a year earlier to deal with Zamorin’s admiral, Kunjali Marakkar, had to eat the humble pie and compelled the Portuguese to give up any further attempt to subdue the Zamorin. On the other hand, the Zamorin’s attack on the fortress of Chaliyam succeeded after a seige of four months.

In an interview Commander K.C. Anil Giri, Officer-in-charge, Project Seabird, Karwar, told me that the Portuguese first came to Anjediva islands - a group of five islands in Karwar - and from there attacked Goa. Anjediva has an area of about 85 hectares and has a fresh water tank which was the main attraction for all mariners who came that side. The



Indus Valley boat models



Model of a Terracotta boat excavated at Lothal



Boats of Konkan coast (Karwar)



Bombay boat builders caulking the boat



Boats of Konkan coast (Karwar)



The widowed Portuguese flag mast at Anjadiva island fort.



A Karwar boat showing outriggers



Boatbuilders at work.

Portuguese built a stonewall around for fortification and installed a large number of guns. There are still about 45 to 47 cannon well embedded in the surrounding walls.

Cdr Giri also told me that at one time the ports of Tellichery and Cannanore were connected with an undersea tunnel. The passage constructed around 1650 AD was 12 to 13 km long and served the purpose of security of these two flourishing ports which handled large quantities of spices from the rich hinterland for export. Now that tunnel is no more in use. According to Cdr Giri, Anjediva island is the first place where the Portuguese flag was hoisted and the last point from where it was pulled down. The widowed flag mast can still be seen on a raised platform. (See picture)

After the death of Castro till the loss of Portuguese independence to Spain in 1580, the Portuguese power declined in the East. During the interim period, many naval battles were fought and a large number of ports constructed. As early as the arrival of Vasco da Gama, the Raja of Kolathiri in 1498 ceded some land and a wooden fort was completed by 1505 which was converted into stone construction in 1507 AD.

Thanks to the Raja of Cochin, a coconut fort went up in 1503 which was replaced by stone by Almeida in 1504 at top speed. The embattlement at Anjediva came up the same year. Four forts were constructed at Goa after it was conquered in 1510. The forts at Calicut and Chaliyam came up in 1513 followed by those at Quilon (1519), Chaul (1521), St. Sebastian (1532), Bassein (1534), Diu (1536), Daman (1537) and the forts at Asherim and Manora in 1556. "Though the Portuguese had over fifteen thousand miles of

coastline to hold in Asiatic waters, their fleets guarded them effectively.”⁵⁸

To recapitulate, the Portuguese raised a storm in the peaceful waters of India. There were no forts on Indian ports, no cannon on Indian ships. The environment of camaraderie prevalent among the international community of maritime merchants was replaced by the Portuguese with daredevil buccaneerism and tall claims for monopoly rights on certain searoutes and trade in specific commodities. To meet the challenge posed by Portuguese warships, the entire pattern of Indian shipping underwent an unprecedented change. The Indians tried to catch up with the new technologies and put up a tough resistance. The intruders collapsed more under the weight of their own mismanagement, indiscipline and widespread corruption. The induction of the Dutch and the English accelerated the debacle.

The system of cartazes was not properly implemented and any vessel could go anywhere with any cargo after greasing the palm of the concerned officers. Most of the Portuguese were more keen on carrying on private business and reap maximum profits. They had perhaps no alternative, as the salaries were low and seldom paid regularly. The rank and file were busy in backbiting and anybody could write to the King directly complaining against even the governor or the viceroy who were highly arrogant. The Lisbon government did not have adequate number of ships to carry on the bludgeoning trade, “never more than 300 ships at the height of maritime glory...”⁵⁹

The fleet was overworked and the vessels always overloaded. Therefore shipwrecks were common. During 1585-97, out of 66 ships that sailed for India, only 34

returned. Quite a few vessels broke from the fleet in their anxiety to reach Portugal early to sell private goods at a premium, altogether an ignoble saga leaving behind a track of mistakes which those, who followed them, tried to avoid. But the Portuguese made an irreversible impact on Indian shipping which was never the same as before their arrival.

CHAPTER VI

Shipping Under the Mughals

The Mughals had their home in Asia at a location as the heart has in the human body. In India, their capital was at Delhi and Agra - both far away from the sea. They were a land-based people and till their empire extended in the west to Gujarat, or in the east to Bengal, they did not have much contact with the sea waters. As such, it is generally held that the Mughals never had any navy worth the name. It is true that their navy was not a match to that of the Portuguese, or the rulers of Indian maritime states like those of the Zamorins of Calicut, the Cholas of Coromandal or even the Maratha fleet, but they were certainly keenly interested in navigation. Their navigation was mostly riverine but they also built ships of considerable size capable of carrying over five hundred soldiers, and were mounted with guns. They fought many naval battles on the mouths of the *Ganga* and some of the ships ventured over the seas. They also took some interest in overseas trade but not to the extent of writing anything home about.

The founder of the Mughal empire in India was Zehri-ed-din Muhammed Babar who was born at Ferghana in Central Asia on 14 February 1483. He was the son of Umer Sheikh Mirza - the fourth son of Taimur - by his wife Kutluknigar Khanum tracing her geneology to Chengiz Khan¹. Thus "the blood of the two great scourges of Asia,

Mongol and Turk, Chengiz and Timur, mixed in his veins, and to the daring and restlessness of the nomad Tartar, he joined the culture and urbanity of the Persian.”² The conquests of Chengiz Khan in the beginning of the thirteenth century and of Amir Taimur towards the end of the fourteenth, “were conducted with an exterminating cruelty and a cold contempt of human life and suffering of which history affords perhaps no other example.”³ Taimur invaded India in 1398, nearly two thousand years after the great Indian rational pacifists, the Buddha and Mahavira, and eight hundred years after Mohammed began preaching the religion of peace and human brotherhood - Islam. It is indeed a painful travesty of truth that many followers of Mohammed, the man of peace, turned out to be the most ruthless ravagers.

Like the Persians, Greeks, Romans, Turks and Mongols, Babar had also heard numerous tales of the immense wealth of India. If the Portuguese sought an alternate sea route to India to control the spice trade and crush the Moors, Babar dreamt of establishing an empire in this land. He had been emboldened by his conquest of Kabul, Ghazni and Kandahar and had dependent principalities of Badakhshan and Kunduz. It is only after consolidating his position in his own region, which took him about twenty two years to achieve, he thought of trying his fortune in India—an ancient land, which had given many arts and sciences to the human race and had ruled in many areas of Southeast Asia for nearly a thousand years.

Lane-Poole says, “The inhabitants of the vast and populous countries of India seem to have been doomed, from the earliest times, to be the prey of every invader who came upon them from the north; while they, on the other hand, never made conquests of any importance, at least in histori-

cal times, beyond what are considered as the natural limits of the country - the Himalaya mountains and the *Indus*.”⁴ He adds, “During the Hindu period, which may be considered as reaching down to about the year one thousand of the Christian era, all India was subject to races of men...” and mentions “the ancient inroads of the Persians and the Greeks...”⁵ We will allow this myth to lie in its place when he candidly acknowledges “our ignorance of their previous history...”⁶ But it is amusing to note that when Darius takes a few districts in the Punjab, and Alexander conquers that Persian satrapy, it is called as conquering “all India.” For one thing the Greek soldiers were feeling home-sick, secondly they refused point-blank to invade India where they had heard even the women wield weapons to safeguard their sovereignty.

A few Sultans had only a toe-hold in Sind and many had not known India south of *Narmada*, but they are projected as having conquered “all India”. It was only Alauddin Khilji who had gone south up to Madura. When Babar did occupy the throne of Delhi, the Portuguese had already set up a dozen ports on the western coast, their writ ran over a major portion of the Indian seas, the country south of *Tungabhadra* had a very powerful and prosperous Vijayanagar Empire, the navy of the King of Calicut was harassing the Portuguese who respected the Maratha navy of Shivaji and considered it as “their equal” on sea. Certainly India was not a “doomed” country.

In May 1526 Babar sat on the throne of Delhi and wanted to take permanent residence in India which he claimed “belonged to the House of Taimur, whose sole representative he was now...”⁷ It may be noted that during all these military campaigns, he had been fighting mostly

with Muslim rulers. At the time when Babar occupied the throne of Delhi, the area under his control included "the Kingdom of Delhi, which reached from the Salt range of the mountains of Kashmir to Bihar, and from Gwalior to the Himalayas - ruled by three Kings and one Raja, north of the *Narbada*, who had very extensive power."⁸ Gujarat in the west, Bengal in the east and Malwa in the middle "were three formidable and independent kingdoms..."⁹ In the next eight months after the defeat of Sultan Ibrahim, his possession extended "from Attok to Behar; and from Kalpi and Gwalior, to the mountains of Himalayas."¹⁰ Among the Hindu rajas he encountered during his further conquests, he met his match in the head of the Rajput Kingdom of Chittor - Rana Sanga who when defeated, "was badly mutilated and bore eighty wounds from the sword or the lance on various parts of his body."

In India, whatever area he controlled lay in the north. "The princes to the south of *Narbada* were altogether independent of Delhi."¹¹ In the north, in the upper and lower Sind "he had little direct power"¹² although the Khutba was read in his name. "To the east of the *Indus* all the Punjab, including Multan, - and to the south and east of the *Satluj* the rich provinces of Hindustan lying between that river and Bihar on the one side, and the Himalaya mountains and the countries of the Rajputs and of Malwa on the other, - were subject to him; the western boundary being nearly a line marked by the fortresses of Biana, Rantambor, Gwalior, and Chanderi.

On the south, towards Bengal, "the limits of his authority are not well defined."¹³ The Rajput states, "the shattered Kingdom of Malwa, Bundelkhand, and Bengal were still independent states"¹⁴ and they were not subject to Delhi. A

detailed description about Babar's possessions at his death has been given to show that not even the founder of the Mughal empire, much less many minor Sultans could be called the king or emperor of 'India' by any stretch of historical facts.

Navigation Under Babar

Coming from a land of climate of extremes where rivers would have been a rare sight, Babar must have been excited to see so many, and some of the greatest rivers in India. Almost all rivers bore boats on their bosoms and that should have fired his imagination.

Babar always preferred to travel by water rather than by road. He was an expert swimmer and had crossed *Ganga* at Buxar in thirty-three hand strokes around 1527 or early 1528, and returned immediately to the bank without taking any rest. On 27 February 1526, he passed Kanauj and encamped on the west bank of *Ganga*. His soldiers seized about thirty to forty boats of different sizes.

There are two early references to the naval exploits of Babar: one in 1528 when he fought a naval battle with the Rajputs on the *Ganga* near Kanauj and the other with the Afghans of eastern provinces on *Gogra* when the enemy offered a naval encounter with 150 boats. He crossed the *Yamuna* in March 1529 with 420 boats.¹⁵ Babar writes: "A favourable wind having sprung up and flowing down the river, they hoisted the sails of a Bengali boat and made her tow the large vessel which went very quick... I embarked and sailed a little way up the river and then returning again crossed over to the north side of the *Ganges* and brought the boats close to the bank."¹⁶ Syed Hasan Askari also refers

to the battle of boats and artillery fought by Babar with the Afghans in May 1529 on the confluence of the *Ganga* and the *Gogra*, and the flotilla of war boats equipped with artillery used in lower Bengal against the foreign pirates of Arakan and the Assamese.¹⁷

Babar had acquired a large number of big boats and ships to an extent that he could wage naval wars on mighty rivers like the *Ganga* and *Gogra*. These engagements were not like the Portuguese sea battles fought against the rulers of the Malabar coast but his fleet, which could carry gun carriages and indulge in artillery bombardment successfully, was strong enough to take on Afghan navy in Bengal.

Babar loved his vessels and had given them interesting names. One very large ship had the honour of being called *Babri*. The one constructed just before the battle with Rana Sanga was named *Aaraish* (The Repose). A boat which was presented to him by his craftsman Araish Khan was named after him as *Aaraish* and he ordered another deck to be raised on the boat. Sultan Jalaluddin presented to him as *Peshkush*, a very big boat which on account of its liberal capacity was called *Gunjaish* (The Capacious). Additions were also made to this vessel to improve its fire power. A *donga* which was always at his beck and call for undertaking odd jobs was called *Farmaish* (The Envoy).¹⁸

Babar left the throne of Delhi, in spite of palace intrigues among his other sons, to his eldest son, Humayun in December 1530. "His name means 'fortunate' and never was an unlucky sovereign more miscalled."¹⁹ Though twenty-three at the time of inheriting Babar's possessions, he lacked persistence and perseverance. He had spurts of energy which soon gave way to indolence. He wrested Bihar from Mahmud

and conquered Malwa and Gujarat - the two together equal in area to all the rest of his Kingdom.

In his naval engagement with Sher Shah at Chausa in 1539, he engaged a large number of boats on the east bank of the river *Karamnasa*.²⁰ The boats were filled with soldiers armed with matchlocks, spears and swords. But the 'battle of the *Gangas*' opposite Kanauj, a year later, sealed his fate and for the next fifteen years, he led an unsettled life. It was only in 1555 that he recovered his throne. He had hardly enjoyed his kingship for six months when he slipped down the polished stairs of his palace and died in his forty-ninth year in January 1556.²¹ It is a strange coincidence that his grandfather also died of a fall from a cliff, Babar, his father and he himself, all the three died young before reaching their fiftieth year.

Akbar the Great

When Humayun was wandering through the deserts of Rajputana encountering great hardships, on the way to Amarkot, Akbar was born on 15 October 1542.²² At the accidental death of his father on 24 January 1556, Akbar suddenly found himself the king of his father's possessions at the age of fourteen. At the time of his accession, the only parts of India he inherited were the Punjab and Delhi, the land lying between Peshawar and Agra. In addition, he had some parts in what is now Afghanistan. The Afghans held the valley of the *Ganga* and Bengal; the Rajputs were independent in the west. Elsewhere in India, there was political chaos. The Bahmani Kingdom in the Deccan founded by Hasan Gangu in 1347 had disintegrated by the end of the fifteenth century.

Akbar on ascending the throne had "at most a precarious footing."²³ Besides dissensions and disruption among the

petty-minded rajas and rulers within the country, the other most important development was the presence of a foreign power on the west coast of India. The Portuguese had not come for trade and commerce but had far sinister designs of establishing an empire. Akbar, even after he had extended his kingdom to the coastal regions, did not pay proper attention to the Portuguese menace. Rather, he acquiesced in the system of *cartazes* introduced by them, instead of openly challenging it and crushing their depredations with a heavy hand.

In 1575, Begum Gulbadan alongwith other distinguished ladies, including a wife of Akbar, while proceeding on a Haj to Mecca were detained at Surat for as long as one year to obtain a permit of safe conduct from the Portuguese.²⁴ Even such a disgrace did not rouse royal anger and the Great Mughal failed to raise a navy powerful enough to put the Portuguese in their proper place.

Akbar, above all, was quite competent to handle the situation successfully. His grandfather had his one leg in India and the other in West Asia. Humayun was away from India for about nine years taking care of his possessions like Balkh, Badakhshan, Kabul and others in that region. But Akbar, born in Rajasthan, mainly concentrated on India, and vigorously worked to extend and consolidate his kingdom in this country. Within two years of his taking over, Gwalior fell and the following year, Ajmer was occupied.²⁵ Chaffing under the masterful management of Bairam Khan, Akbar took up reins in his own hands in 1560.²⁶ In a landmark victory, he stormed Chittor in 1567 and by 1572 most of the Rajputs were brought into his empire. Gujarat was occupied in 1572 - though conquered in 1584 - Bengal was sacked in 1575, Kashmir in 1587, Orissa in 1590, Sind in 1592 and Kandahar in 1594.²⁷

After penetration into coastal states like Gujarat, Bengal and Orissa, he had no excuse of not knowing the sea. It is said that he saw the sea for the first time when he was in Gujarat but at that time he was thirty years old. At least when in 1575 he had to swallow the ignominy of begging for a permit for his Mecca-bound ship from the Portuguese, his blood should have boiled. In vain did the poet-laureate of Akbar, Faizi, lamented:

*Badarya khunam gharq ahl-i-Firang,
Buraam az dil-i-ahl-i Islam zang,
Dar-i-basta-i Kaaba rā-wā khunam
Sikandar sifat sair-i-daryā kunam*

In a free translation: "I would drown the Firangis in the sea,

I would remove the rust from the heart of the people
of Islam,

I would open out the door of Kaaba like Alexander,
I would voyage safely on the seas."

We are inclined to agree with Vincent Smith, when he says that "the Mughal emperors never showed any aptitude for maritime affairs or possessed a fleet worth mentioning. Their coasts and neighbouring seas were thus at the mercy of the Portuguese who felt no scruples about the manner in which they exercised their power."²⁸

From Akbar to Aurangzeb, every emperor was gravely conscious of his naval weakness. Some did try to provide teeth to the navy, but to develop a flourishing overseas trade or measuring cannon with the Portuguese caravels always

* Latifa-i-Fayyazi in a letter to M.Abdul Haque Muhaddis, Delhi

remained a far cry. Akbar streamlined what Abul Fazl calls, his 'admiralty', designating the crew and their duties. Under *Ain* 26, Abul Fazl says: "In every part of His Majesty's empire, ships are numerous; but in Bengal, Kashmir, and Thathah (Sind) they are the pivot of all commerce. His Majesty had the sterns of the boats made in shape of wonderful animals, and thus combines terror with amusement. Turrets and pleasing kiosks, markets, and beautiful beds, have likewise been constructed on the rivers. Along the coasts of the ocean, in the west, east, and south of India, large ships are built, which are suitable for voyages. The harbours have been put into excellent condition, and the experience of seamen has much improved. Large ships are also built at Ilāhabās (Allahabad) and Lahore, and are then sent to the coast. In Kashmir, a model of a ship was made which was much admired."²⁹ Badaoni does not think very highly of Abul Fazl who has given greater details about mundane matter than hard facts about the volume of overseas trade; the commodities which were imported/exported and the names of the countries involved in such commerce; the guns or cannon with which the ships were fitted; the naval battles His Majesty fought, and where.

About the crew, Abul Fazl informs us that "the number of sailors in a ship varies according to the size of the vessel." He enumerates twelve classes which more or less correspond with those given by Ibn Mājid in his *Fawa'id*. The classes are 1) *Nākhudā* or the owner of the ships; 2) *Muallim* or captain who guides the ship to its destination; 3) *Tamdil* or chief of the *Khalasis* or sailors; 4) *Nākhudā-khashab* who assists in loading and unloading of cargo; 5) *Sarhang* or mat; 6) *Bhandari* in charge of stores; 7) *Karrani* who keeps the accounts of the ship; 8) *Sukkangir* or helmsman; 9) *Panjari*,

the look-out man on the top of the mast; 10) *Gumti* who bails out water from the ship; 11) *Top-andāz* or gunner required in naval fights; and 12) *Khārwa* or common sailors who set and furl the sails. To bring out the importance - or neglect - of shipping by His Majesty, suffice it to say that in all of the volumes of *Ain-i-Akbari* (total 1633 pages) and *Akbar Nama* (total 2518 pages), Abul Fazl makes only two references to shipping and shipbuilding - to the former in *Ain* 26, only three pages, and to the latter in *Akbar Nama*, only nine lines.

The reference to a ship built in 1594 may be quoted here, and is as follows: "a ship was completed on the banks of the *Ravi*. The length of the keel (*cobi*) which formed the foundation of this wooden house, was 35 *Ilahi* yards; 2936 large planks (*shahtir*) of *sal* and pine (*nāgā*), and 468 *mans* two *sers* of iron, were used in building it, and 240 carpenters and blacksmiths and others were employed. His Majesty went to see the spectacle. A thousand persons struggled to drag it along. In ten days, it was brought from the dry land to the water, and sent to Bandar Lahari. There was much difficulty on account of deficiency of water."³⁰ There were separate cargo and pleasure boats and also flotillas of armed cruisers and boats. The largest ship of the Great Mughal was called *Ganji-Sawai* and "had 800 guns and 400 muskets on board."³¹

When shipping records were poorly maintained, it is difficult to compute the quantum of overseas trade. Moreland makes a rough estimate of "the aggregate of Indian sea-going merchant ships at a maximum of 60,000 tons; 40,000 tons is probably a liberal allowance for coastal craft, and 20,000 tons for fighting ships, making 120,000 tons in all."³² This would also include some ships built in Europe and may

constitute as much "as one tenth of the total." At the same time, those Indian ships have to be added which were employed in direct trade between the Red Sea on the west and Pegu, Malacca, Java and Sumatra on the east.

In spite of the decline of the erstwhile Hindu kingdoms in Southeast Asia region by the fourteenth century, the trade with that region had not stopped totally and maritime mercantile associations continued. The annual output of ships had also to be offset against the annual loss. In terms of volume of trade, "in the middle of the sixteenth century (that is, during the reign of Akbar) Garcia da Orta put the imports at a figure which may represent either 250,000 or 400,000 pounds; (it may be mentioned here that the unit employed by Garcia was equivalent to 352 lb, but elsewhere it is said to be equivalent to 600 lb.) Linschoten, writing about 1590, gives 400,000 pounds (3000 quintals), and this figure is probably official."³³

Akbar had followed the system of *mansabdari*. The *mansabdars* had to bring a fixed number of men-at-arms, horses, and elephants, into the field, and were rated according to the number they brought. They had also to construct a certain number of boats which could be requisitioned by the Emperor when required for war or for transport. There were *mansabdars* of ten, twenty, a hundred, a thousand or of a few thousand. For example, Abul Fazl was a *duhazāri* that is, had to maintain 2000 horses; Raja Bihari Mal, the Lord of Amber, who married his daughter to the Emperor, was a *panjhazāri* (5000 horses) and Raja Man Singh was the first "Commander of 7000 horses."

These *mansabdārs* and other *Umraos* or *Amirs* were given *jagirs* to maintain their forces from the revenues they

collected from the farmers, a fixed portion of which had to be deposited in the Royal treasury. In addition, each was given an allowance on per horse basis. The emperor kept his own select force, a *Nowwara* (fleet), and owned prime land wherever he wanted. But it saved the administration from the bother of maintaining a full-fledged standing army, or collecting land revenue from all the land they possessed. In the bargain, a new class of pampered noblemen came into being who generally enjoyed the freedom to fleece the farmer in the name of the king and lead a life of vulgar ostentation.

According to Badāoni, the license, laziness, extravagance and greed of *mansabdārs* ate up the grant, and no money was left to pay the soldiers. The system saved the government much money-collecting trouble but impoverished the peasantry at large, adversely affecting their purchasing power and therefore industrial production, trade and consequently shipping. The Emperor, however could summon at will, a good many soldiers and up to 40,000 boats, including many war boats, for his own use.

Other Mughal Emperors

Two intensive naval battles were fought during the reign of Akbar's successor Salim, better known as Jahangir (1605-27). Both these major battles, in which over a thousand war boats were involved, occurred in the eastern province of Bengal - one with Musa Khan (1610-11) and the other with Raja Pratapaditya (1612). A look at Broucke's map of Bengal (1660) will highlight the immensity of the task, and the glory of victory over such powerful adversaries. These were no naval wars waged on open seas but certainly, if we may say so, far more formidable. In this region, the *Ganga* and the *Brahmputra* have numerous branches criss-crossing

the land forming many islands through confluences. There are many marshy patches difficult to ford.

In lower Bengal, the Mughals had set up their first military post at Dacca during the days of Akbar. At the beginning of Jahangir's reign, "most of the strategic naval ports in Bengal were in the possession of Bhuiyas and Magh-Feringi pirates."³⁴ Raja Pratapaditya of Jessore-Khulna was one of the prominent Bhuiyas of Bengal and owned as many as one thousand war-vessels of the best type. The Bhuiyas had raised strong naval forts on the confluence of important river routes. These naval stations were built a few miles off the confluence and links were maintained by means of canals. The Maghs were the rulers of Arakan coast and lost no opportunity to attack Indian boats and take away the goods.

Among Muslims, the hardest nut to crack was Musa Khan. In addition, many Portuguese pirates and other foreigners were quite active. They mostly indulged in piracy but were always prepared to side with any party who would pay the price. The Mughal naval forces were initially weak but Jahangir tried to reorganise his army as well as 'navy' by appointing Ihtimam Khan as chief admiral of Mughal navy, who was ably assisted by his son Mirza Nathan. At that time Islam Khan was the governor of Bengal and Ibrahim Khan was the Mughal viceroy (1617-21).

The importance of Dacca as an army centre was fully appreciated when Islam Khan launched his 'Bhati' campaign against Musa Khan in 1608. In view of its naval strategic importance, Dacca was made the Mughal capital of Bengal. To provide additional defence for Dacca, and to serve as advance bases, two more naval stations were put up at

Khizrpur or Hajigunj near the confluence of rivers *Dulai* and *Lakhiya*, and at Qudam Rasul opposite Narayanganj with water on three sides. Down the river *Lakhiya* stood the port of Sonakanda, 'a rectangular enclosure provided with a bastion on the river frontage.' A number of other temporary, and some permanent, naval ports' docks, guard houses were constructed by the Mughals at strategic points as a prelude to the final putsch. On the eastern side, the Mughal viceroy built naval ports to block the approach of Maghs through the rivers.

Off the coast of Chittagong, and only six hours sail from there, lay the island of Sondwip in the Bay of Bengal. The Maghs and Feringis used it as their advance base. Therefore the Sondwip island overlooking Bengal in the north and Arakan on the east was first captured by the Mughals. Proper arrangements were made to protect the coastal region of Bengal against depredations of the Magh-Feringi pirates.

The two grants of Nawara *jagir* and Omleh-Asham 'were appropriated for the maintenance of troops and artillery for the defence of the ports on the sea coasts'.⁴⁸ The Mughal viceroy took special steps to strengthen the fortifications of frontier thanas, the forces of the *faujdars* at Jessore and the island of Dakhin-Shahbazpur. The number of warboats was raised to 5000 and naval posts on the river *Meghna* were taken care of.

Musa Khan, son of Isa Khan, was a premier Bhuiya of Eastern Bengal and was the ruler of Sonargaon. His strength lay in a large number of warboats and naval ports like Khizrpur, Qadam Rasul, Sonargaon and Jatarpur. When Ihtimam Khan was commanded by Emperor Jahangir to proceed to Bengal, his fleet on leaving Delhi comprised 295

warboats properly equipped with heavy cannon and other requisite materials. A large number of boats joined the fleet at Allahabad. By 1609, Islam Khan took position with a strong army on the right bank of river *Karatoya*. Ihtimam Khan moved his fleet to Kalabari ready for the 'Bhati' campaign. In a coordinated advance by land and water, both the parties joined at Ghoraghat.

After the army and the navy reached the confluence of *Ganga (Padma)*, *Ichhamati* and *Bhaleshwari*, three naval stations were raised and a group of boats were anchored at each. The governor asked Ihtimam Khan to supply from the imperial fleet 1000 musketeers, 50 cannon, 100 *maunds* of gunpowder, 100 *maunds* of lead and other materials to Shaikh Kamal and Mirak Bahadur in order to enable them to proceed to Dacca and to prepare themselves for attacking Musa's capital from that side.³⁶ Musa fought bravely but the Mughals defeated him in June 1610.

Battle With Raja Pratapaditya

Raja Pratapaditya was a more formidable foe. Mirza Nathan's *Behristan* and the travel diaries of Abdul Latif and European travellers of the time, "all testify to his personal ability, political pre-eminence, material resources and martial strength particularly in warboats."³⁷ He built his boats with '*sundari* oak' which was in plenty in his kingdom. According to Roy, "It is more lasting in water than teak wood... it required special knowledge in building boats of (*sic*) this kind of wood," and he says so on the authority of Mitra.³⁸ The typical boats of Jessore are *dingi*; *pansi* which is bigger than *dingi* and has a roof; *bachari*, which being stronger can carry more load than *pansi* and has no roof. The bigger *bacharis* are called *bachariships*. The Raja's war vessels included *ghurab*, *kosa*, *gallivat* and *balam* of which he owned over a thousand.

Abdul Latif tells us that in 1608, the Raja's fleet included 700 boats and when the Mughal general, Ghiyas Khan, was sent against him, his son Udayaditya faced him with 500 war vessels. His each naval station had additional war boats to meet any emergency. The Raja also owned a fair number of fast moving ships for maintaining quick communication between various naval stations and a number of *jung* boats to transport horses, elephants and other heavy loads. Such huge boats were surely as good as ships in use at that time. His fleet was sometimes supported by cavalry. He employed mostly local people but had also Portuguese and Muslims of whom Shaikh Kamal and Shaikh Jamal played a prominent part in naval wars against the Mughals.

After their victory over Musa Khan, the morale of the Mughal armed forces was high. Islam Khan despatched a large army under the command of Ghiyas Khan. Mirza Nathan was in charge of the naval force which comprised the fully furnished imperial fleet of 300 warboats, plus the acquired fleet of Musa Khan and those of other vassal landlords. By December 1611, the fleet and the army reached a place called Salka near the confluence of the *Jumna* and *Ichhamati*. When the Raja came to know that the Mughals had crossed the river, he divided his army into two divisions. One took position at Dhumghat while the other comprising 500 warboats, including *ghurabs* each with thirty sails, was sent under the command of his son and the Jessore admiral Khwaja Kamal.

As the two contenders played the deadly game of hide-and-seek on water and land, canals were dug, trenches made and makeshift forts with garrison put up according to the exigencies of the situation. At times Udayaditya suddenly sprung up in the midst of Mughal construction work. He

gave Khwaja Kamal the “command of the van with all the *piara*, *kosa*, *balia*, *pal*, *ghurab*, (floating battery), *machua* and *jalia* boats.”³⁹ Another Jessore commander, Jamal Khan was posted at the entrance of Salka fort. But the imperial fleet started pounding the Jessore fleet and cannon were booming all along which in a swift action surrounded the fleet of Mirza Nathan.

He showered arrows upon the forces and continued his advance against heavy odds. That broke the unity and discipline of the Jessore fleet and in the confusion that followed, Khwaja Kamal was killed. Even Udayaditya was about to be captured but “one *piara*, four *ghurabs* and one *machua* which carried some Feringis proved loyal to their master and cast anchor, thus obstructing the way of the six imperial boats”⁴⁰ The Rajkumar escaped with forty-two boats but the rest of the fleet and the fort of Salka fell into the hands of the Mughals.

Significant Naval Battles

These victories against formidable foes like Musa Khan and Raja Pratapaditya were no less significant than regular naval battles on sea. With these wars, a lot of booty and a large number of warboats equipped with cannon and war material fell into the hands of the Mughals. Some of the boats were bigger than the sea-going vessels of those days. With these naval ‘exercises’ carried out in the east, Jahangir could have easily taken up the next step to raise a strong navy to face foreign sea powers on the west coast. He could have begun with a base in Gujarat which had been with the Mughals since 1572.

The developing situation offered all the advantages but perhaps his intelligence service was poor and he was not

properly briefed. Instead of trying to stand on his own strength to turn the tide against the Portuguese, he preferred to encourage other foreign powers to deal with them. This turned the Indian Ocean into an arena of international intrigue and spoil.

In 1606, a Dutch agency was allowed at Surat. The Portuguese did their best to ruin the Dutch trade and it was mainly due to their intrigues that Van Deynsen, incharge of the Dutch trade, had to commit suicide. From the Mughal side, there was a “semi-official invitation to the Dutch in 1613 to send a fleet against the Portuguese”⁴¹ as they had caused much damage to Gujarat shipping. The Dutch did send a party which left Masulipatanam on 8 May 1615 and reached Surat after a journey of one month and eleven days. Thus they earned the favour of the Mughals. About the same time, on 7 June 1615, the emperor signed a treaty with the Portuguese to keep the Dutch and the English out of India. But in 1612, when the Portuguese fleet had attacked British ships off Swally - the Surat bar - the English had inflicted a crushing defeat upon them and the balloon of Portuguese supremacy over other European powers was pricked once for all.

The victory had greatly enhanced the English prestige in the eyes of the Mughals. As a reward, they were permitted to establish a factory at Surat. The imperial ‘navy’ did have a large number of war vessels of upto 1000 tons burden and about nine hundred merchantmen. ‘Some of them were posted in the Gulf of Cambay and at Surat but they did not venture into the sea, inspite of having 30-40 pieces of cannon, without European pilots.’ If Jahangir had trained his own sailors to face the foreigners from a position of strength, and allowed them only trading rights to suit the

interest of India, the history of this sub-continent would have been different.

Shahjahan when he ascended the throne in 1627 (according to Lane-Poole in January 1628, (p 327), he did pretty little to follow up the unfinished task as far as raising a strong navy was concerned. One achievement under his regime in this respect was the construction of a naval fort at the junction of the *Ganga* and the *Brahmaputra*. The fort was called Sangramgarh after the name of the admiral. Shahjahan did not turn his attention to the west coast or even to Gujarat where trade had received a serious set-back after the Dutch in 1616 had closed their factory at Achin. It was for the market of the Indies that they used to buy large quantities of cotton goods from Gujarat. The main articles for export from Surat were cloth and indigo. The Dutch also controlled spice trade of the Southeast Asian islands and raised prices at Surat so much so that the English President at Surat had to complain to the East India Company.

The Portuguese used to please the Emperor by supplying some presents and articles of overseas commerce but they continued to maintain their obstinate stance over the high seas. That enraged the Mughals and whenever they “came across the Portuguese in the rivers, they used to despatch a fire-raft laid on 16 war-vessels of different sizes laden with large quantities of firewood, pitch, salt-petre and sulphur, but their attempt to set fire to the enemy’s flotilla mostly failed.”⁴²

Aurangzeb

Aurangzeb put his father in confinement at the Safdarjang tomb and fought his brothers on land and water to ascend the throne. He did not exhibit half that pluck to deal with

the foreigners. The international environment was in his favour. Aurangzeb did realise the importance of a strong naval force but his Vazir Jafar Khan tried to dissuade him as “there is lack of men to direct.”⁴³ But Mir Jumla constructed an imperial *nowwarah* and Aurangzeb made good use of it, in his war against his brother Shuja and in conquest of Assam. It was the battle of Khajwa fought on 5 January 1659 between Aurangzeb and Prince Shuja which marked the end of the war of succession to the throne of Delhi. Retreating through Allahabad, Chunar and Monghyr, Shuja came back to Rajmahal but a division of the imperial army entered Rajmahal unopposed and the entire country on the western bank of *Ganga* from Rajmahal to Hughli was lost to Prince Shuja. When the imperial forces reached Rajmahal, Shuja’s army was separated by the *Ganga* and the war henceforth became a naval war where Shuja had some advantage. But “too much dependence upon the low-caste Portuguese ruined the cause of the Prince.”⁴⁴

Battle with Ahoms

The second naval battle fought with Ahoms of Assam in 1662 was also riverine. Ahoms had all sorts of boats like *kosas*, *ghurabs* and *bacharis* in large numbers. “The *Fathiya* seems to put an incredibly high figure exceeding more than 32,000,” but Talish confirms this figure.⁴⁵ As regards armament the *Padishanamah* writes: “The Ahom naval soldiers mostly use bows and arrows and matchlocks but do not come up in courage to the Mohammedan soldiers.”⁴⁶ Although the *kosas* could move with lightning speed, the *bacharis* were heavy and unfit for close fighting.

Mir Jumla’s flotilla in the Assam campaign comprised “159 *kosas*, 48 *jalias*, 10 *ghurabs*, 7 *parindas*, 4 *bajras*, 50 *pattelas*, 2 *salbs*, 1 *pital*, 1 *bhar*, 2 *balam*’ 10 *khagiris*, 5

mahalgiris, 24 *palwars*, and other small boats.”⁴⁷ The powerful *ghurabs* and floating batteries were in charge of the Dutch. In addition, there were Portuguese and English officers. In this campaign, the naval force was fully supported by the army comprising 12,000 cavalry and 30,000 infantry. It was this combination of a coordinated force which won the day for the Mughals against a powerful and brave naval enemy.

The last noted naval battle in the time of Aurangzeb was fought with the Magh and Feringi pirates in the eastern waters. The main stronghold of Portuguese pirates was the island of Sondwip, Dianga (20 miles south of Chittagong) and Syriam on the coast of Arakan. Their flotilla included *kartus*, *jalias*, frigates, small barks and the like. The Maghs concentrated on Chittagong, the hilly tract lying between Bengal on the north-west and Arakan on the south. According to Mirza Nathan’s *Behristan*, the Arakan king had ten thousand warboats, besides infantry and elephants.

Fathiya says: “Their cannon are beyond numbering; their flotilla exceeds the waves of the sea in number.”⁴⁸ Most of the Magh ships were *ghurabs*, *jalias*, *khalus* and *dhums*, the last two being larger than the former. There were small and big *kartus* fitted with guns. The larger ships were strongly built with hard core timber and the balls of *zamburaks* and small cannon could not pierce them. The Feringis used swift-going craft called galleys or galliots with fifteen to twenty rowers on each side and could carry about a hundred persons. Some of them carried telescopes to survey the merchant ships in the Bay.

The imperial fleet under Ibn Husain comprised “288 ships - 21 *ghurabs*, 157 *kosas*, 3 *salbs*, 96 *jalbas*, 2 *bacharis*,

6 *parendas* and 3 unidentified.”⁴⁹ On 14 January 1666, in the seventh year of Aurangzeb’s accession, the Mughal flotilla crossed the river *Feni* and entered Kumiria creek, only two marches short of Chittagong. Farhad Khan and Mir Murtaza advanced by land to cooperate with the navy. The Maghs could not resist the Mughal fleet who seized Magh *ghurabs* and chased the fleeing fleet. According to *Alamgir-namah*, ‘After the first naval battle, the enemy fled.’ Ibn Husain with his light and swift ships gave chase and captured 10 *ghurabs* and three *halias* (*jalias*) from them. Soon afterwards, the larger ships (*nawara-buzurg*) of the enemy came in sight, for a second time, fought a long and severe fight and at sunset fled from the scene of action.

To Aurangzeb’s Viceroy, Shaista Khan, goes the credit under Emperor’s orders to raise a first class naval fighting force at a cost of about Rs. 14 lakh to subjugate the independent powers in the eastern sector and suppress the piracy menace right up to the Arakan coast. One bold step forward and he could have asked his Gujarat governors to strengthen Mughal navy in the west. Aurangzeb had the energy, enterprise and the will to do it. While in Kashmir, he received a report that one of the imperial ships carrying pilgrims to Mecca had been captured and plundered by the European pirateers in the Arabian Sea. That ship also carried some pilgrims belonging to the Imperial harem. That enraged Aurangzeb and the incident spurred him to create a powerful war-navy. But, if Manucci is to be believed, Aurangzeb abandoned the project “thinking that to sail over and fight on the ocean was not the thing for the people of Hindustan but only suited to European alertness and boldness.”⁵⁰

The Mughals had mastered the technique of mounting an attack with a well coordinated action of army and the

navy. Panikkar has rightly observed: "In the interval between the breakdown of the Portuguese authority and the establishment of British supremacy, Indian naval interest witnessed a remarkable revival. The admirals of the Mughals at Cambay and Janjira developed a naval power sufficiently strong to protect the commercial interests of the Empire."⁵¹ It is true that at no time was the Mughal navy so strong as to challenge and achieve victory over the naval power of the Portuguese or the Dutch and English who reached the coast of India after undertaking a voyage of over four thousand miles. But it is also true that after the Mughals employed the Siddis of Abyssinia, their navy had acquired some teeth.

Aurangzeb cultivated the Siddis who rose to very high positions in the Mughal navy. After the partition treaty of 1636, the west coast became a part of Bijapur which recognised the Siddi chief and conferred on him, the title of a Vazir. The Siddi chief maintained an efficient naval fleet. Throughout the seventeenth century, he held the position of an admiral, first of the Sultanate of Bijapur, and later of the Mughal Navy.

"The Abyssinians were hardy, skilful and daring mariners and most efficient fighters at sea among the Muslim races, while their courage and energy, joined to coolness and power of command made them enjoy a high estimation as soldiers and administrators".⁵² Aurangzeb "sanctioned an annual grant of four lakh rupees to be paid to the Siddi for the maintenance of his fleet and sealed the new alliance by conferring the title of 'Yakoot Khan' upon Kassom Siddi."⁵³

The Maratha Navy

Any insinuation therefore that in India in the seventeenth century, there was no fighting naval force or good

admirals, is utterly wrong. The Maratha navy was considered by the Portuguese as their equal at sea. In the state of Marathas, according to Amatya's *Rajniti*, navy was "considered as an independent limb."⁵⁴ Shivaji was firmly of the view that for ensuring a flourishing maritime trade, sovereignty on the sea was of utmost importance and a precondition. Shivaji was born in the year when Shahjahan ascended the throne (1627).

His theatre of action was mainly the state of Karnataka including the Konkan coast. The coast of Konkan then stretched from Daman in the north to Goa in the south, comprising three main districts of Thana, Kolaba and Ratnagiri, and the former princely states like Janjira and Sawantwadi. In the seventeenth and eighteenth centuries there were several creeks - some of them now silted - navigable by small boats, and a few like Mhasala and Mandad even by large vessels.

The entire region was hemmed with three types of forts - inland, headland, and island forts which played a prominent role in the history of medieval shipping. The importance of coastal forts came in full play during the campaigns of Bassein, Janjira and Khanderi. The headland forts, situated as they were on the heights of Ghats, could guard the coast over a long range and Vijaydurg testifies this. The island forts like Arnala, Janjira, Kolaba, Khanderi and Sindhudurg could defy the main power on the shore. That was the geographical configuration in Konkan which was fully made use of by the Marathas in making their history.

Shivaji built his navy brick by brick keeping the naval strategy in mind. His first priority was to capture the Portuguese forts and build new ones on suitable locations.

The Portuguese had started construction of a fort in 1590 at Bassein and completed it by early seventeenth century. It was next only to Goa in importance and had the second largest habitation of the Portuguese. The fort had eleven bastions and massive parapets and embrasures. The fort which was well equipped with water-tanks, magazines and other provisions - had a small citadel inside and a moat to the land-side filled with sea water. The Marathas conquered the fort and used it as a model for constructing their own sea forts.

Between 1653 and 1680, Shivaji completed a number of naval forts, the major ones being those of Vijaydurg, Suvarnadurg, Sindhudurg and Kolaba.⁵⁵ Then started a series of conquests. As early as in 1657 Shivaji took Kalyan and Bhivandi in north Kanara which was then part of the Bijapur territory. He seized Chaul, an ancient port on the coast of Kolaba, and fortified it. The murder of Afzal Beg - a huge man compared to Shivaji - in an embrace using *singhnuk* (a weapon invented by him) in 1659, facilitated his conquest of south Kanara. During the same period between 1657 and 1659, he laid the keel of his first ship in the creek of Kalyan.⁵⁶

In the seventh year of this event, Shivaji attacked Basrur in 1665 with as many as 85 ships. He had laid such a sound foundation of Maratha navy that his successors and admirals turned the tables on foreign powers. "Throughout his career scarcely a season or a month passed without some naval engagement. Kanhoji Angre as the admiral of the Chhatrapathi had every right to levy tariff, to force ships of all nations to purchase his passport, and to negotiate with any power he liked."⁵⁷

Just as the Portuguese forced the Indian rulers, including the Mughals, to take their cartazes for voyages on Indian waters, so Kanhoji executed his rights by sheer might. Hutchinson comments that Shivaji proved "the Hindu race can build a nation, found a state, defeat enemies; they can direct their own defence, they can protect and promote literature and art, commerce and industry; they can maintain navies and ocean-trading fleets of their own, and conduct naval battles on equal terms with foreigners."⁵⁸

Pragmatic Policy

In building up his kingdom bit by bit, Shivaji followed a pragmatic policy. He raised his resources from looting and plundering the rich. He was rather a small man with a big heart. Unlike most of the rulers of those times, he had a high moral character. He treated all women - even those of his defeated enemies - with the utmost respect, always helped the poor, and commanded great respect. The aim of his life was to clear the coasts of India from the menace of foreigners and he was overbrimming with patriotic zeal. He looted several towns, conquered many battles but could not humble the Siddis who worked in close collaboration with and full support of the Mughals.

In 1657, when the Imperial Mughals in their attack on Bijapur had conquered the fort of Bidar, Aurangzeb had to return to north to attend some pressing problem. That caused confusion among the nobles and Shivaji took advantage of the chaotic situation. He crossed the Ghats and descended upon north Konkan. He took the town of Kalyan, and Bhivandi fell into his lap. The fort of Mahuli was taken and he proceeded south to Kolaba. As the going was good, he conquered in quick succession Surgad, Birwadi, Tala, Ghosalgad, Sudhagad, Kangori and Raigad. The fort of

Raigad was later chosen by him as the capital of his government. In his conquest of south Konkan between 1661 and 1663, he “attacked Dabhol, sacked Rajapur and brought the chieftains of Pullivana and Shringarpur to their knees. Almost the whole of Ratnagiri district came under his triumphant banner.”⁵⁹ But Kalyan, inspite of his best efforts, was lost to the Mughals.

On 6 January 1664, Shivaji arrived at Surat. To complete the formality, he sent a letter to the governor and three eminent merchants - Haji Said Beg, Virji Vohra and Haji Rasim, to negotiate a settlement. No reply was received and the governor Inayat Khan “fled to the fort and shut himself there, leaving the town at the mercy of the enemy”.⁶⁰ For four days, the Maratha chief plundered the city of Surat. But a few foreigners - the English and the Dutch merchants - resolved to defend themselves at all costs. Shivaji left them alone but when the English tried to intervene on behalf of Haji Said, he threatened to kill them all and raze their factory to ground. On hearing about the approach of a Mughal army, Shivaji left Surat “with immense booty in gold, silver, pearls and diamonds amounting to more than a crore of rupees.”⁶¹ The English and the Dutch were praised for their valour by Aurangzeb and he reduced their custom duty by half per cent.

Next year, in 1665, Shivaji attacked Basrur with 85 big and small ships. Although no naval engagement occurred, he brought home enormous treasure.⁶² On 3 October 1670, he again paid a visit to Surat. The defenders as before fled to the fort and he had the whole town at his feet. The English, Dutch and the French put up no resistance and were not molested as they bought private peace and promised not to interfere. The Tartar Sarai was looted and vast treasure

acquired. On 5th October Shivaji returned taking with him booty estimated at about sixty-six lakh of rupees. Before leaving, he sent a letter to the officers and chief merchants of Surat threatening to return next year "if he was not paid twelve lakh of rupees yearly."⁶³

Fight Against Siddis

The Siddis were a hard nut to crack. They were entrenched in the fort of Janjira off Bombay. Since they constituted a small military aristocracy, their constitution provided for the rule of the ablest. On the death of the chief, not his son but the first officer of the fleet succeeded to the governorship - a salutary custom. That ensured efficient administration in an alien land far away from their home in Abyssinia. To one who wanted to rule Konkan, it was necessary either to make an ally of the Siddis or render them harmless. Shivaji had captured the eastern part of Kolaba but the Siddis still controlled Danda-Rajpuri and the adjacent region. Shivaji fully appreciated that without naval supremacy, his position as a land power was also precarious. As his courtier, Sabhasad, said: "The Rajah put the saddle on the ocean."⁶⁴

There was no straight fight between the Marathas and the Siddis. The political situation was highly intricate and the odds were against Shivaji. The Mughals did not relish the rising power of the Marathas and made use of the Abyssinians to put them in their place. Under the order of Aurangzeb "vessels of various sizes and burden were constructed at Surat...and were placed at the disposal of the Siddis."⁶⁵

The Siddis enjoyed his moral and material support and there was perfect cooperation between the fleets of the two.

Shivaji was not amicable to the English who hoped to reap more benefits if they sided with the Mughals. Nor did they like to patronise the Siddis and were quite happy that Shivaji was at dagger's drawn with them. When Shivaji plundered Surat, the Mughal officers sought English protection. The English President Oxinden seized the opportunity and asked for concessions for the Company. The Mughal Emperor granted a *parwana* allowing the English, the customs revenue of Surat for full one year.

Shivaji's next step was to conquer the impregnable fort of Janjira, the bastion of the Siddis. In early 1665, Jai Singh had opened an all-out campaign against Shivaji. During his invasion of Bijapur, he invited the Siddis to join the Mughal force. "By the Treaty of Purandar," says Sarkar, "the Mughals left the territory of Janjira adjoining Shiva's dominion to him, if he could conquer it. Shiva also offered to attempt the conquest of Janjira for the Emperor."⁶⁶ In 1669, Shivaji mounted his attack on Janjira with full vigour. By October, "the Siddi was so very hard pressed and Janjira was in such danger of being starved into surrender that he wrote to the English merchants of his resolve to hold out to the last and then deliver it up to the Mughals."⁶⁷

Next year, Shivaji staked all his resources to capture the island which he had made a matter of personal prestige. "Fath Khan, worn out by the incessant struggle, impoverished by the ruin of his subjects, and hopeless of aid from his suzerain at Bijapur, resolved to accept Shiva's offer of a large sum and a rich *jagir* as the price of giving up Janjira."⁶⁸ That enraged a revolution among his people. Fath Khan was imprisoned, his government was seized by the revolutionaries who requested Adil Shah and the Mughal Viceroy in Deccan for immediate aid.

The Mughals readily agreed and the overlordship of Siddi fleet was transferred from Bijapur to Delhi. Siddi Sambal, one of the leaders of revolution, was made imperial admiral with a *mansab* and a *jagir* yielding about rupees three lakh. His two associates, Siddi Qasim and Siddi Khairiyat, were given the command of Janjira and the land dominion respectively. The Siddi fleet was taken into Mughal service and the successive admirals enjoyed the title of 'Yaqut Khan.' Meanwhile, Shivaji marshalled his forces at Nandgaon, ten miles north of Janjira, comprising 160 small vessels, and an army of 10,000 horses and 20,000 infantry with adequate quantity of provisions for a siege and large number of mining tools. Another 3000 soldiers were kept ready to embark in emergency at a moment's notice. The siege was so successful that "the Siddi's fleet could not enter Janjira."⁶⁹

Siddi Sambal sent an urgent message to the Mughal governor of Surat for immediate succour. "Under Aurangzeb's order, a fleet of two-men-of-war and several frigates was fitted out at Surat and it left with 2000 recruits as well as provisions and ammunition under the command of Siddi Kassem".⁷⁰ The Mughal fleet sailed down the coast against Shivaji's fleet and a decisive naval battle was fought near Vengurla. Siddi Kassem proved his worth as an admiral and pushed back the Maratha fleet. Shivaji not only failed to capture Janjira against the combined forces of the Siddis and the mighty Mughals, but also lost his hold on the fort of Danda.

To the end of his life in 1680, and throughout the reign of his son, Sambhaji (or Shambhuji), hostilities continued between the Marathas and the Siddis. Repeated attacks on Janjira in September 1675, in April 1676 and in October

1678 proved of no avail. It was only Kanhoji Angre, son of Tukoji Angre who was a *killedar* under Shahji Bhosale, that the Maratha navy re-established its fading glory. Kanhoji was a first rate seaman of his times. As the admiral of the Chhatrapati, he could use his own seal. He dealt with the foreign powers on the west coast severally or collectively as the situation demanded.

It was he who succeeded in paying the Portuguese in their own coin. He compelled the ships of all nations to purchase his passport to ply on Indian waters. In 1702, he “captured near Calicut, a merchantship with its English crew, as it was without his passport.”⁷¹ Four years later, “in 1706, the Marathas and the Angres captured three more English ships of which the *Diamond* had 12 guns.”⁷² In 1712, Kanhoji seized a yacht of the Bombay Governor alongwith the *Anne* of Karwar. He entered into a treaty with the English and its terms “throw considerable light on the question of the sovereignty of the sea.”

According to Sarkar, Shivaji had a fleet of “seven hundred vessels of various sizes and classes such as *ghurabs* and *pal* gun-boats (see figs 2 & 3), *tarāndis*, *tāramlies*, *gallivats* or *galbats*, *shileārs* (see fig 4), *pagārs*, *manchwās* etc.”⁷³ But Sabhāsad and Chitnis, says Dr Apte, put the figure at four hundred including his mercantile marine.⁷⁴ The English factory reports never put “the number of his fighting vessels above 160, and usually as 60 only.”⁷⁵ A report of the English factor in Surat written in February 1663 says that Shivaji was fitting out large vessels to trade with Mocha in Western Arabia. He also fitted three-masted vessels to trade with Muscat, Mocha, Basra and ports in Persia.⁷⁶

To recapitulate, from the date of Vasco da Gama's arrival at Calicut in 1498 till the middle of the eighteenth century, the Zamorins of Calicut, Shivaji and his admirals Tukoji and Kanhoji Angre, and the Mughals with the help secured from the Siddis, put up a tough fight against the incursions of European powers in Indian waters. Babar, the founder of the Mughal empire, and his son Humayun, had a fascination for swimming and sailing. They built big boats and gave them nice names but their interest was mostly confined to pastime and pleasure. They came from landlocked regions and the first time when the Mughal empire touched the sea was when Akbar conquered Gujarat. Akbar developed a department of admiralty and raised an Imperial *nowwara*. In the system of *mansabdari* he followed, his *umraos* had to maintain a standing army and a fleet of boats. He could, in addition to his *nowwara*, summon as many as 40,000 boats at short notice. His successors, Jahangir and Shahjahan, fought great naval battles in the Bengal and Assam regions.

Aurangzeb was very keen to build a strong naval force so that the ships of *haj* pilgrims going annually to Mecca are not molested or detained. But his senior officers are said to have advised him against this. He had all the money and materials to raise a superb navy. His boats as big as ships had carried out several naval battles while pursuing Prince Shuja. Vessels of various sizes and strength were being constructed for long in south-east and western coasts. Shivaji's ships were constantly harassing the Portuguese and other European powers on the sea.

The Portuguese acknowledged Shivaji as their equal on sea. The later Marathas compelled the ships of all nations to purchase their passports. It was therefore a great lapse on the part of Aurangzeb not to build a powerful Mughal

navy. By the middle of the seventeenth century, the Portuguese power was on decline. The English and the Dutch had not yet dug deeply into Indian soil and the time was opportune to undertake such a task.

Instead, Aurangzeb used the Siddis to safeguard his ships on the western coast from Goa to Gujarat. They did an admirable job and saved the Mughal power in the south during the life-time of Shivaji. Refusing to walk on the crutches of the English and the Siddis, if Aurangzeb had overruled his Vazir and set about having his own independent powerful navy, the European powers might not have been able to entrench themselves on this land and sea - at least during the life-time of Aurangzeb.

Another point worth noting is that none of the Mughals ever thought of developing mercantile marine in a big way. Apart from historic supremacy of the Arabs to act as intermediaries between the trade and commerce of India with West Asia and European nations, during the days of Mughals, the Gujaratis, Konkanis and Malabaris on the west coast and Cholas, Oriyans and the Bengalis on the east, were carrying on flourishing overseas trade.

Shivaji was annually fitting three-masted vessels to trade regularly with Persia, Muscat and Mocha. It is indeed surprising that the vast potentiality of maritime commerce did not meaningfully cross the mind of the Mughals. Aurangzeb by pursuing his policy of discrimination against the Hindus, rather ruined trade instead of encouraging it. Perhaps an ingrained vellication to venture over the high seas might have been the basic cause of both—neither raising a powerful navy, nor undertaking extensive overseas trade. Otherwise, the history of shipping during the period of the Mughals would have been altogether different.

CHAPTER VII

Dutch, French, British and Other Trading Companies

Between the fifteenth and nineteenth centuries, four major European powers dominated shipping in the Indian Ocean. The Portuguese pioneered the alternative sea route round the Cape of Good Hope to the East and ruled the seas roughly for about hundred and fifty years. They broke the 5000-year old peace of the Indian waters, perpetrated many brutalities over the people, laid down novel norms of maritime trade, committed quite a few mistakes, which, those who followed them, tried to avoid, and were finally packed off from the region when rival powers began to play a prominent role.

Next to enter the waters were the Dutch who were earlier under the rule of the Iberian Peninsula. To outflank the Portuguese, they initially went straight to the Indies, where the position of the Portuguese was weak, and made that area the theatre of their action. Their strategy was first to consolidate their power in the Far East, and gradually move towards the west in alliance with the local rulers - who were keen to oust the Portuguese - till they reached the Malabar coast and entered India. The French followed the same route but were not so successful. The wars between the British and French on the European mainland had their adverse effect on their overseas relations.

The Germans and Danes tempted by the Portuguese maritime adventures, also tried to participate in the Indian Ocean shipping trade. On the second voyage of the Portuguese to India in 1505, in terms of a treaty signed between German traders and Lisbon, there were two shrewd Germans who managed to be included in the expedition. Their names were Hans Mayr and Balthasar Sprenger. Their reports back home created tremendous excitement and more German traders were anxious to venture into India. Over the years, German trading posts were established along the west coast of India, the important ones being at Daman, Goa, Anjediv, Cannanore, Cochin, Cranganore and Quilon.

The condition of the treaty was that half the goods brought back by the Germans were to be off-loaded at Lisbon for the King of Portugal.¹ This arrangement suited both the parties. The Portuguese were short of ships and supplemented the supplies from India through at least half the goods carried in German bottoms. The Germans got an opening into the trade of Oriental luxuries. Having settlements at a large number of trading centres in India, they must have carried on a highly successful commerce.

To establish the veracity of such reports, a research group was formed at Augsburg (Germany). Thus began the Mercator Expedition in a 7.9-metre boat which travelled on high seas and covered a distance of about 4000 km to trace the trading posts of the first Germans. Information about the expedition was collected from Commander A.V. Gupchup of the Maritime Museum at Bombay set up under the Western Naval Command in 1979. Ten years later, a Maritime Heritage of India gallery was also opened by no less a person than the late Prime Minister Rajiv Gandhi. So rich is the maritime history of India and so colossal is the

ignorance about its achievements that the two organisations have a stupendous task before them. At present the Museum is housed in *INS Angre*, a ramshackle building and with the funds at their disposal, they cannot be expected to achieve much.

We do not know what happened to other trading posts of the Germans but their one settlement on the Maldivé Islands was functioning when Haider Ali was the ruler of Mysore who, to chastise the English, invited the German East India Company to open a factory in his dominion. The Germans set up their office on the Indian mainland in 1779 at Nandangadde.² The factory functioned for nearly a decade but later it was wound up as it could not stand competition from the English company. The Danes settled at Colachel and Edava on the Kerala coast 'in a thatcht House of a very mean Aspect.' The Dutch Chaplain, Visscher, had no good opinion about the Danes. They stayed for some time at Quilon and set up a factory on the Coromandal coast for a brief period.

The Zamorins of Calicut and the navy of Marathas constantly harassed the Portuguese. The Dutch delivered the *coupe de grace* and ousted them for good confining their 'Overseas Empire' to the toeholds in Goa, Daman, Diu and Anjediva. The English helped all those who wanted the Dutch out and here also the Marathas and the Zamorins played a prominent role. The French really did not count for much. The Mughals with the help of the Siddis played only a peripheral part. The British played their cards with consummate skill. They began by beseeching permission to build a factory here or a fort there and finally had the last laugh by handing over a vast empire to the British Crown in 1858.

When we analyse the reasons for the dominance of a handful of merchants from far off lands over the peoples of the East, several significant factors have to be borne in mind. One, all Europeans had to undertake a long voyage through the Atlantic Ocean before entering the Indian Ocean and reaching the shores of India or the islands of Indies. For embarking on a voyage of 4000 miles or more, in addition to having navigational maps and charts, the captains of the fleet had to take all measures to meet any eventuality. The ships had to be built strong and sturdy to take the buffets and beatings of the ocean waves, even storms. All the ships were invariably constructed to contend with war-like situations which may be mounted by pirates, their rivals on the high seas, or by the aliens on the coast. Thus the voyage itself constituted a great learning experience in oceanic navigation and naval warfare.

Two, in the early stages, each voyage was a great event. The captain of the fleet and the crew not only had royal blessings but the support of his government. On the eve of Vasco da Gama's departure, a service was held at the church. He was blessed by the Pope. The King himself saw him off. After 1600, prayers and royal patronage was not considered sufficient to a trading company. Professionalism of a high order was introduced in the form of joint stock structure, comprising two types of people. There were some who provided the finances or owned the ships and expected a good return on their investment.³ The management of the voyage and the trade were handled by others who were known for their experience in the line.

Three, the western companies which voyaged all the way to trade with India and the Southeast Asian region were manned by highly experienced people who had a keen

technological edge over the peoples they came to trade with. They had practical experience of oceanic navigation and had better instruments to steer their ships through the high seas. Their ships were designed to carry warfare equipment which was far superior to the coastal peoples of the Orient. When the Portuguese were shelling the coast of Calicut, the Zamorin employed two Italian experts to cast cannon for him and teach his people how to fire them accurately. In many coastal wars, most of the shells fired by Indians fell far off the mark.

Four, with wider exposure and greater knowledge of the shipping ports and the merchandise available, they soon mastered the demand and supply mechanism of the region. Cotton textiles from the Coromandal coast in India, for example, they found vital for purchase of pepper in Indonesian archipelago. They soon discovered "that the whole Indian Ocean had a structural unity created by the periodic rhythm of the Monsoon winds and by economic interdependence between one region and another."⁴

Five, most of the western companies got guidance from a unified centralised governmental control which was the source of their inner strength. And wherever, and whenever, that central authority was missing, the merchants could not make much headway. As pointed out by Parkinson: "Facing the Atlantic were the Portuguese, Spanish, French, Dutch, English and Scandinavians. Each of these peoples would play some part in the expansion of Europe but the success of each would depend, first of all, on their forming what we call a unified national state. With such a unity achieved," he adds, "their further progress would depend upon their formation of maritime bases from which to operate. The momentum of each campaign would result from local enterprise being backed by national effort."⁵

In India of the fifteenth century and onward, the trans-oceanic exploits of Kaundinyas, Srivijayas and Shailendras in the Southeast Asia had long been forgotten. On the western coast, whenever the sailors did not hug the coast, they rode on the Monsoon winds over high seas to distant lands. When nature has bestowed this unique blessing over the Indian seas, it was but natural for them to take advantage of it. The people of Gujarat and Malabar coasts on the west and those of Bengal, Kalinga, Tamil Nadu on the east, had their own glorious innings. But no one can ever live on his past. And the Indians were not at all prepared to face the merchant warriors from the West. They had not fortified their ports. They had not armed their vessels. At the first shock, they were far behind in technology. Above all, there was no centralised authority to take an overall view of the situation, and effectively deal with it.

The Dutch

The Dutch began with the great advantage of having traded with Lisbon for a long time. That enabled them to have a fairly good idea of their business practices. Since the Portuguese did not have adequate number of trading vessels, they concentrated on wholesale business with the Orient. All their ships were pressed into service to bring the much sought-after-in-Europe commodities from India. The Dutch bought those at Lisbon and set up an extensive network to distribute them to various parts of Europe. As early as 1504, King Manuel of Portugal had decreed that no maps should mention the navigational routes beyond Congo and all places on existing maps had been carefully erased. All astronomical almanacs and charts were classified as top secret documents. The first English *Nautical Almanac* was published by Neville Maskelyne within 30' accuracy only in the year 1767.

But Portuguese could not lay the lid on for a long time. Jan Huygen van Linschoten, the Dutch clerk in the service of Archbishop Don Frey Vincente da Fonseca lived in Goa for six years, from 1583 to 1589. He collected a lot of information about the goings-on in India and published his work, *Itinerario*, which "is a remarkable testimony from an independent witness to the extent of Portuguese involvement in Indian Ocean trade and society."⁶

The English merchants had also been making repeated attempts to gain access to Asian markets. First they tried to reach Asia by the north-east or north-west passage. When these failed, they thought it prudent to follow in the footsteps of the Portuguese. The first suggestion came from a London merchant, long resident in Seville, who procured an introduction to Henry VIII about the year 1527. His proposals eventually led "to the formation of the Muscovy Company for trade with Russia in 1553, the plan being open to trade with Persia as well."⁷

The real break came when the merchant-traveller, Ralph Finch, "travelled between 1583 and 1591 and published a full account of all the territories round the Indian Ocean from Ormuz to Goa and so to Malacca and Siam..."⁸ His narrative to the English was far more comprehensive than that of Linschoten to the Dutch from Goa. Finch even gave a list of goods which could be obtained from the East: pepper, ginger, cloves, nutmeg, mace, sandalwood, camphor, musk, amber and precious stones.

Nothing much happened after the receipt of report from Finch. "What may have clinched the matter was the capture in 1591, of the Portuguese ship *Madre de Dios*, brought into Dartmouth with 1600 tons of cargo including carpets, calicoes, silks and spices valued at £ 150,000. It heightened

the sensation caused earlier by Drake's capture of the *San Felipe*, with a cargo worth £ 100,000."⁹ This encouraged the English to send out the first voyage of three ships in 1591 under the command of George Raymond and James Lancaster. This turned out to be a disaster.

The Dutch were more cautious. They sent Cornelius de Houtman to Lisbon to collect every bit of information which supplemented the details sent by Linschoten. Armed with whatever details the Dutch could collect, they sent out the first fleet of four vessels in 1595 commanded by Houtman from the roadstead of Texel. The expedition slipped India and went directly to Indonesian islands. "Of the 259 men who left with him, only 89 returned" and the sale of merchandise brought in 80,000 florins which "failed to answer high profit expectations."¹⁰ These speculative expeditions "were only marginally different from the privateering raids that were being fitted out at the time in England and the Netherlands".¹¹ That is how both the nations thought of organising their adventures on sound lines and the commercial structure of the joint stock company was conceived.

At the intervention of the States-General as many as sixty private companies were amalgamated in the Netherlands at Amsterdam to form the VOC or the Dutch East India Company in 1602. They contributed a capital of 6,424,588.4 florins. The States-General subscribed 25,000 florins. The company was a confederation of thirteen chambers. These chambers deputed sixty-five directors to the company. The Confederacy of the Chambers vested all powers in a committee of seventeen members which took all important decisions. This unification was a great achievement of the Dutch which enabled them to take unified policy decisions and forge ahead with great confidence.

The Dutch knew that the entire western coast of India was infested with the Portuguese who were in reasonable control of trade there. Therefore the VOC, or the Dutch East India Company, went to Java and set up their government at Batavia. Initially, the objective of the Dutch was trade but Koshy is of the view that "the activities of the Dutch testify that they had a definite plan of conquest of the Eastern countries."¹² Perhaps they were keen to earn the maximum profits for their shareholders, and for themselves, and later discovered that territorial gains would certainly advance their commercial interests. In the Far East, the Portuguese presence was rather weak and disorganised.

Within three years of the formation of the Dutch Company in 1605, they seized Amboyna from the Portuguese. With the conquest of Jakarta on 30 May 1619 by Jan Pieterz Coen, the company's position in the island could be said to have been fully established. Reporting the event to the directors, Coen wrote: 'The foundations of the Rendezvous so long desired have now been laid. A large part of the most fertile land and the most prolific seas of the Indies is now yours; ...Behold and consider what a good courage might accomplish and how the Almighty has fought for us and blessed your honoures.'¹³

Thus, the foundations of the Dutch power in the Indies were laid. The task of empire-building was completed by Antony van Diemen by bringing about the downfall of the Portuguese whose possessions in the Indies and elsewhere fell one by one like the nine pins. In 1641, Diemen wrested Malacca and breached Albuquerque's defence system in the East. From Malacca, the Dutch extended help to the Sinhalese kings in their fight against the Portuguese. In 1654, Van der Heyden after prolonged siege occupied Colombo and

expelled the Portuguese from Ceylon.¹⁴ After the capture of Jaffna in the north in 1658, their hegemony over the island was firmly established. That brought the Dutch next door to India. But before turning their attention to this prized plum, they wanted to complete their control over the islands of the Far East.

By the middle of the century, the company was able to complete this task with a fair amount of success. There were three great Sultanates of Mataram in Java, Atjeh, and Ternate further east of the northern arm of Celebes, in the Molucca passage. From Mataram in the island of Lombok east of Bali, to the island of Ternate is a long sea passage and that proves the hold of the Dutch over the intervening sealandes. The King of Macassar and the Sultan of Atjeh fought the company's claims with determination and it took the Dutch many decades of hard fighting before they were able to establish their authority finally by about 1680.

Meanwhile, Admiral Verhoff landed at Calicut on 8 October 1608 and concluded a treaty with the Zamorin on the fifth day promising to expel the Portuguese. In return, the Zamorin agreed to protect and allow free trade to the Dutch ships expected to reach there from Bantam.¹⁵ Another treaty was signed between P.S. Groes and the king of Kayamkulam on 1 March 1643 when the Dutch agreed to protect the king who promised to supply pepper and other commodities. Next, their eyes turned to Cochin which, according to one European traveller, was after Goa "the 'chiefest' place that the Portugals have in the Indies, and there is a great trade of Spices, Drugges and all other sorts of Merchandise."¹⁶ Their next target was Quilon. It was 'a fort of the Portugals; from whence commeth great store of pepper, which commeth for Portugal; for oftymes there

landeth one of the caracks of Portugal,'. "The Dutch Admiral Ryckloff van Goens conquered the fortified city of Quilon from the Portuguese on 29 December 1658."¹⁷

A treaty of alliance was concluded with the queen of Quilon on 7 January 1659. The Portuguese however reconquered Quilon on 14 April in the same year and the Dutch garrison was withdrawn to Colombo. The Portuguese resisted the siege heroically for three months and finally surrendered the city on 7 January 1663.¹⁸ In quick succession, the following month, was taken the town of Cannanore, 'without a gun fired or a sword drawn against it.' Thus, after 150 years, the Portuguese flag ceased to fly over the coast of Kerala.

After performing the 'benevolent act' of expelling the Portuguese from India - save a few pockets like Goa, Daman and Diu - the Dutch East India Company set about in right earnest in consolidating their trade so that their ships could carry oriental luxuries to their land to be sold there at exorbitant profits. The trading monopolies in certain commodities which the Portuguese had secured at the point of the sword, the Dutch tried to acquire as friends with promises to keep the Portuguese at bay and overplaying the 'danger' posed by the growing presence of the English and French.

The Zamorin of Calicut, who had the most bitter experience of the devious methods of foreign merchants, saw through the game of the Dutch and sounded the bell of caution. He took the lead in calling a meeting of all the rulers from Cochin to Kanya Kumari at Quilon to defend and maintain their trading rights against the Dutch. This was reported by the English factor at Calicut to his superiors in

his letter dated 22 March 1669. A clear-cut alignment was evident - the Zamorin and some other rulers on one side; and Cochin, Dutch, English and French on the other. Since the Dutch were allies of Cochin, they were regarded as enemies by the Zamorin and got embroiled in ruinous wars with him.

When the Zamorin was rather lying low, the English chief at Tellichery, Robert Adams, saw his chance to intervene on behalf of the Zamorin who at his instigation attacked the fort of Chettuwaye at 4 a.m on 22 January 1715 and literally caught the Dutch napping. The Zamorin destroyed the fort, took away the Dutch guns, and the Dutch sentenced the officer-in-charge to death for dereliction of duty. The English as a reward were allowed to build a warehouse at Chettuwaye and trade in pepper and other commodities.¹⁹

To retrieve their honour, the Dutch Admiral and commander-in-chief of operations at Batavia, came with a large army and was joined in India by the forces of Cochin. The fort of Pappinivattam was razed to ground, the Zamorin lost heavily and the Dutch were allowed to rebuild the fort of Chettuwaye. From then on, the Dutch started directly intervening even in the political affairs of Kerala rulers and went to the extent of deciding on the succession of various rulers. They took full advantage of the traditional rivalry between Calicut and Cochin but the Zamorin never accepted the suzerainty of the Dutch and maintained his independent status. The Kerala rulers did not like the Dutch intervention in their purely family matters and harboured a grudge against them.

Rise of Travancore

About that time rose a king in Travancore who had the energy, imagination and vision to deal with the fast deterio-

rating situation. His name was Marthanda Varma. With the dawn of the eighteenth century, the sun of the Mughal Empire was setting. The English and the French, in addition to the Dutch, were contending to fill the gap. "The Dutch came up against the Raja of Travancore in 1739, and though their power in neighbouring Ceylon was considerable, the battle ended in a disaster for the Netherlanders, whose landing party, including over a hundred Europeans, had to surrender ignominiously."²⁰

First, Marthanda Varma set about conquering the petty rulers of Kerala parading themselves as kings so as to establish a centralised authority in the region. Next, he refused to recognise the Malabar Command as a political power with a right to interfere in such local matters as succession to the throne. Third, through his conquests in Kerala, he shattered the Dutch monopoly of trade. Fourth, on 22 May 1743, in a palace at Mavelikara, the King and the Dutch Commander Reinicus Siersma signed a historic treaty agreeing "to live in peace and friendship in future."²¹

The company was granted permission to carry on trade in linen and other goods. The Raja also promised to supply to the Dutch 1200 candies of pepper at Rs 54 per candy. The company agreed to supply to the King of Travancore annually lead, gunpowder, muskets and flints equivalent to the value of 100 candies of pepper. The company was to help the King against the French and the Nawab of Carnatic, and maintain neutrality if he took action against the king of Kayamkulam. In return, the King promised not to invade Quilon from that year.

Marthanda Varma was keen on keeping the neutrality of the company so that he could consolidate his empire by

conquering more lands without their interference. In February 1745, he marched with his full army against Tekkumkur and planned to reinstate the rebel prince in the Kingdom of Vadakkumkur. It was a test case. The Dutch resident refused to intervene. Another treaty was signed between the Dutch and the King on 15 August 1753 which broke the Dutch system of alliances with the rulers on the Kerala coast by offering vast commercial concessions as a bait.²² Travancore agreed to supply the Dutch 5000 candies of pepper, 3000 candies at Rs.65 each and the remaining at Rs.55 per candy which was almost half the market price. The Dutch agreement to supply Rs.12000 worth of all sorts of ammunition at cost price was a great gain for Marthanda Varma as the English East India Company had persistently refused to supply any arms.²³

The King of Travancore deserves all the credit for compelling the Dutch to give up their political pretensions in Kerala. The rest of the job of reducing their power was completed by the Zamorins of Calicut. The Zamorin pioneered a move to array many native rulers against the Dutch East India Company. When the crunch came, these rulers sided with the Zamorin and did not help the Dutch. The Zamorin conquered the whole of Cochin and recovered the possessions lost by his predecessors to the Dutch. After the peace treaty of 1717, he isolated the Dutch from all the rulers of Kerala and undermined their influence.

Exploitation by Dutch

The Portuguese with their brash buccaneerism had annoyed everybody wherever they went. The Dutch arrived Godsend, as it were. They acted as friends of all who were enemies of the Portuguese. That helped them immensely to oust the Portuguese from Amboyna in the Indies to all the

port towns on the west coast of India. In the bargain, they extracted commercial concessions from everybody whom they seemed to help. In fact they were only keen to help themselves. The Dutch were no less exploiters than the people from whom they sought to save the inhabitants of this region. But their methods were not so crude. For one thing, they did not try to indulge in proselytism. Secondly, they refrained from committing naked brutalities like dismembering their victims and setting fire to ships alongwith the people on board. Thirdly, they had little inclination of setting up a Dutch empire in the East.

The English East India Company

The Dutch and the English East India companies came to the East almost simultaneously. A year before the Dutch united company was established, the English merchants had received from Queen Elizabeth the charter giving the company a monopoly of trade in the East. The Dutch as middlemen were supplying to the northern countries, the various oriental luxuries, particularly the much sought after pepper, during the sixteenth century.

‘The Elizabethans lived on salt meat from autumn to spring, their fresh meat was of poor quality in general; for the good of the fishermen the law compelled them to eat fish more often than they cared about and with all this insipid food their craving for pungent flavouring was probably and naturally much stronger than ours. They liked heavily spiced drinks, moreover, for they had no tea.’²⁴ Pepper by then, thanks to the Portuguese, had become an essential ingredient of the English menu. But when in 1599, the Dutch increased the price of pepper from 3 to 8 shillings a pound, the British merchants decided to enter the trade themselves.

“The Company’s first vessel sailed under Captain Lancaster on 24 January 1601. It reached Achin in Sumatra and returned two and a half years later in November 1603 with a cargo of 1,030,000 lb of pepper.”²⁵ Once the ice was broken, many more voyages followed. In Bantam was one of the chief centres of Asian trade where the silks and velvets, porcelain and lacquered ware brought by the Chinese junks, and the cotton textiles of the Gujarati merchants, were exchanged for the pepper and spices of the Malay archipelago. “The third fleet brought back a rich cargo of pepper from Bantam, and cloves, mace and nutmegs from the Spice Islands. An investment of 20,000 yielded a profit of 234 per cent; the cloves, which cost only £ 2048 to buy, sold in London in 1609 for £ 36,287.”²⁶

The difficulty with the English merchants was that they had hardly anything available in England which was in demand in the eastern countries and could be sold in lieu of purchases made. The textiles and other commodities produced in various parts of India were in great demand in the Far East. In fact they had become used to Indian goods for nearly two thousand years and the textiles from the manufacturing centres of Gujarat and Coromandal coast were reaching them regularly since the beginning of the Christian era. If the English company wanted to trade with Far East, it had to pay either in bullion or to offer them goods purchased from India. “Thus, it was to buy textiles that the British sought to establish a trading centre in India, and the place chosen for the purpose was Surat.”²⁷

Prof. Needham also testifies to this arrangement. “Broadly speaking,” he says, “Europeans always wanted Asian products far more than the Easterners wanted Western ones, and the only means of paying for them was in precious metal.

This process occurred at many places along the east-west trade routes, but primarily of course in medieval times at the Levantine borders between Christendom and Islam.”²⁸ But the European merchants after seeing the drain of gold and silver from the Roman Empire during the period extending from 50 BC to about 300 AD to pay for the spices of India and silks from China, had grown wiser and preferred to buy from India and exchange those goods with the purchases of Chinese silks and Indonesian and Malayan spices.

In 1608, the English company extended their enterprise to India. Neither the Portuguese nor the Dutch liked what both might have considered as ‘intrusion’ in their trading territory. “When Captain Thomas Best appeared with two ships off Surat in 1612, the Portuguese sent a fleet against him from Goa.”²⁹ The English made them lick their wounds. Another Portuguese fleet sent against Nicholas Downton in Swally roads, failed miserably. Till then the Portuguese were considered almost invincible on sea by the Indians. These conclusive victories over them established the English at Surat with a bang.

French Connections

The French had made occasional visits to the Malabar coast from as early as 1527, but it was not until the beginning of the seventeenth century that they began organised commercial voyages. According to Panikkar, however, the original idea of the French minister Colbert was to establish French power in Ceylon and with this object “a considerable fleet was sent out to India under Jacob de la Haye in March 1670. But by the time the French arrived, the Dutch had already taken possession of most of Ceylon. De la Haye had to return to France but he left behind Francocis Martin in India who established the settlement of Pondicherry.”³⁰

Watching the eastward voyages of European merchants, as early as in 1601, Henri IV tried to establish a French East India Company but the company was incorporated only in 1664. The French also established their first factory at Surat. Within two years of their arrival in India, “the French founded a settlement at Masulipatam on the east coast by obtaining a ‘*farman*’ from the Sultan of Golconda. By 1688 they had also established a trading centre at Chandranagore and a few other smaller settlements on the east coast.”³¹ In 1701 the seat of “the French Government in India was established at Pondicherry and the settlement at Surat was closed down”.³²

In the 1720s a new company in the form of second French Compagnie des Indes Orientales appeared in the Indian Ocean. “After its organisation in 1721 and 1725, the new company was well endowed with capital and strongly supported by the French state.”³³ In 1725, the French tried their luck on the western coast. A fleet of French ships sailed under the command of Commodore M. de Pardaillan from Pondicherry to the coast of Malabar. Between Cannanore and Calicut, Captain Betrand Francis Mahe la Bourdonnais negotiated a narrow creek, landed his troops and captured a small coastal town which “in recognition of La Bourdonnais’s brilliant effort, Commodore de Pardaillan christened as the town ‘Mahe’ after the captain’s name.”³⁴ Simultaneously, they expanded their settlements on the east coast and acquired Karikal.

The British had the advantage of knowing nearly a hundred and fifty years of shipping atrocities perpetrated in the Indian Ocean. It appears, they used the Dutch to do the dirty job of uprooting the Portuguese from the Indies, Ceylon and finally from India. Meanwhile, the English merchants

kept their pipeline with the Indian rulers and strengthened it as and when possible. Once the Portuguese were ousted, the Dutch, the Indians found to their dismay, stepped into their shoes and started demanding monopoly in the trade of pepper and other spices. They even started taking direct interest in political matters.

The wine of territorial victories here and there went to their head and they marched on right up to Cape Comorin. That extended their line of communication and control which they found difficult to maintain effectively. Their headquarters at Batavia was embroiled in their own complex problems and was not able to extend timely help. The British waited and watched the follies being committed by the Dutch and wherever possible incited the local rulers to rise against the Dutch and assert their political rights. The Raja of Travancore consolidated his power, rallied round most of the rulers, repudiated the Malabar Command and reduced the Dutch to a minor status.

Once the Portuguese and the Dutch were out, the British had only to deal with one European power - the French. In 1744, the war of Austrian succession broke out between England and France and the animosity between the two was reflected in the Indian subcontinent. The French at Pondicherry also suffered from inroads of Shivaji and their defences were at a low ebb. Among European powers, it was only with the French that the British had pitched naval engagements. Most of them were inconclusive and indecisive but each left the French weaker.

There were three reasons why the French inspite of their repeated attempts could not dislodge the British from Indian Ocean region. One, it will have to be conceded that inspite

of having some admirable admirals, their navy was not as strong as that of the British. It also proves that unless a foreign nation is powerful on sea, it cannot hope to control the trade on land.

Two, the French naval base in the Indian Ocean was in the far off island of Mauritius from where it was time-consuming to obtain naval force, nor was it convenient to reach there for repairs and re-arming. The British ships could just sail over to Bombay on the west coast or Madras on the east. Three, on account of perhaps ego problem, or a genuine difference of opinion, there was lack of cooperation much less coordination, between various French authorities.

For example, when La Bourdonnais was the governor of Mauritius, the French authorities asked him to move his naval force to the West leaving him disarmed and defenceless. The British Admiralty took advantage of the situation and deployed a squadron to prey upon the French ships. The French Governor in India, Dupleix, was versatile in statecraft but did not as much appreciate maritime matters. La Bourdonnais was expecting an attack from the British and somehow managed to refit a fleet of nine ships and arrived off Mahe by June 1746. After an engagement with the British on July 7 when Commodore Peyton sailed away, La Bourdonnais wanted to chase the fleeing enemy and destroy him. But Dupleix was not enthusiastic. La Bourdonnais set sail on 12 September 1746, attacked Madras, and within nine days secured the capitulation of the port.

From Entreaties to Empire

The emergence of British naval power in the East went hand in hand with the development of their bases in the sub-continent and tactful handling of the Indian rulers. They took

full advantage of the political confusion prevailing in the country and kept on consolidating their position. Within ten years of establishing themselves at Surat after inflicting a decisive victory over the Portuguese, they conquered Ormuz from Portuguese in 1622 which dominated the entrance to the Persian Gulf.

From Surat, the English extended trade to the inland commercial towns. Factories were set up at textile weaving centres at Broach and Ahmedabad in Gujarat and on distant caravan routes, at Burhanpur, Agra and Lahore. They did not stop there but pushed farther east to Bihar, Bengal and Orissa - the treasure-troughs of India. The goods for exports collected from all these centres were brought to Surat from where they were loaded on ships. Indigo and saltpetre were added to the increasing trade and in 1629, the factory at Surat was upgraded as a presidency.³⁵

The following year, 1630, a severe famine in Gujarat crippled the trade with Surat and the company looked for other sources of supply of cotton cloth. A little scouting revealed that the Coromandal cottons surpassed those of Gujarat and found great favour in England. The company's factors secured a strip of land at Madras which they fortified in 1641. This settlement, called Fort St. George, became a presidency ten years later.³⁶ From there the company's agents developed settlements at Balasore and Hughly to secure the world famous finer cottons and silks of Bengal. Thus, within the first fifty years, "the company had laid solid foundations for profitable trade - cotton goods from Gujarat and Coromandal; silks from Persia and Bengal; indigo from Lahore; pepper from the Malabar ports; saltpetre and sugar from Bengal."³⁷

In 1665, Charles II gifted Bombay - which he had received as part of Catherine of Braganza's dowry - to the company. Full rights were transferred to the company in 1668 and they were delighted to have a place of their own. The island was fully fortified and in 1687, it became a presidency replacing Surat.³⁸ In 1673, the company had acquired St Helena from the Crown as a port of call for home-bound ships. In 1685 it developed 300-mile pepper plantations along the west coast of Sumatra to compensate for the loss of Bantam to the Dutch in 1683.

Except for a brief indiscretion committed by Sir Josiah Child till the early eighteenth century, the officials of the company paid due respect to the representatives of the Mughal Emperor in various provinces. In addressing the Emperor, one of the English Presidents described himself as the 'smallest particle of sand, John Russell, President of the East India Company with his forehead at command rubbed on the ground.'³⁹ But under the instigation of Sir Josiah, the company in 1685 adopted an aggressive policy. It was said: 'His appearance as a city merchant, instead of as the Emperor of China or the Great Mogul seems an error of Providence,'⁴⁰ such was his grandiose arrogance. He felt a deep contempt for everything Asian and due to the harassment of the factors at Hugly by the soldiers of the Mughal garrison, 'declared war on the Mughal Empire.'⁴¹

The result of such a rash action was altogether ignominious. The company's establishments in Bengal were occupied and the company sued for peace. Emperor Aurangzeb agreed after the English had promised 'to behave themselves for the future no more in such a shameful manner.'⁴² "He also imposed fine on the presumptuous merchants."⁴³ The company's factors were allowed to return to Bengal and they settled in a fishing village on the river Hugly.

The former chief factor at Hughly returned to a bend where he had moored his ships after escaping from the troops of Viceroy. "The silting of Hughly made it difficult for the larger vessels to sail up the river. The merchants therefore founded the village of Govindpur and set up a market at Sutanuti...It was here in the 'pool of Calcutta' that on Sunday, 24 August 1690, at noon, the English under Job Charnock anchored. It was to bring out the fundamental mistake of choosing the site of Calcutta that Kipling quipped in his inimitable way: 'Thus the midday halt of Charnock - more's the pity! Grew a city.'"⁴⁴ This became Fort William, kernel of the future city of Calcutta. By 1700 it was sufficiently well established to become a presidency.

According to Jean Sutton, during those days a wave of 'India craze' swept the British Isles...ladies in high society were soon wearing nothing but muslins...and decorating their homes with chintz, the painted clothes of Coromandal. Imports, much of which were re-exported, rocketed, dividends rocketed too."⁴⁵ This economic prosperity created new demands. "In England, France and Spain, the three great Powers at the time, the demand was for muslin and printed textiles from India, for tea and silks from China, and for coffee from the Dutch East Indies...The popularity of Indian textiles became a political issue both in England and in France...By 1695, Indian textiles had displaced British goods so effectively that there was an insistent public demand for a total embargo on Indian textiles."⁴⁶

With their own base at Bombay and additional forts at Madras and Calcutta complete with garrisons and arms and ammunition, the company felt bold to take lively interest in local matters. By the middle of the eighteenth century, other European rivals were almost out, or at least did not pose any threat. The political map of India was criss-crossed with

chaos and confusion. Akbar had laid down three essential lines of policy: the maintenance of a national State; conciliation of the Hindus, and unification of India. Aurangzeb repudiated all three and instead of establishing a national State, he alienated the Rajputs and strived to set up "an Islamic State." After his death in 1707, his governors started asserting themselves. The Central authority was not recognised and each acted as an independent ruler. The Rajputs went back to their own earlier territories and among them Jai Singh of Amber played an important role.

None except the Marathas had a navy of their own. In close cooperation of the navy with a patriotic army, the Marathas emerged as the most important power in a major portion of the country. But in 1723, Baji Rao instead of first consolidating his control in the south, exhibited impatience to attack Delhi and assume the government of Hindustan. "Let us strike at the trunk of the withering tree and the branches will fall themselves," he decided, and it turned out to be a wrong and rash decision.

The English began by taking on the Muslim rulers first. According to Panikkar, Plassey "was a transaction not a battle, a transaction by which the compradors of Bengal, led by Jagat Seth, sold the Nawab to the East India Company. The Nawab's generals, he adds, already in league with the Hindu merchant princes and their British allies, did not fight and the treacherous General, Mir Jumla, received as the price of his betrayal, the Diwani of Bengal.⁴⁷ In the battle of Buxar in 1765, the company's forces defeated the Mughal troops and the Great Mughal became a pensioner of East India Company. Clive, who had come as Governor of Bengal, now obtained from the Emperor, the *Diwani* of Bihar

and Orissa as well. "By this act, the East India Company became in effect a sovereign power on the mainland of India."⁴⁸

British Meet Their Match in Marathas

But Marathas continued to be a thorn in the flesh of the English and they did not give up till at last the country was taken over by the Crown. Even on the sea, as late as 1722, Kanhoji Angrey had repulsed a combined attack of the British and the Portuguese. In 1730, the British naval authorities on the west coast, where they had the garrisoned island of Bombay, had to report: 'Our strength is not sufficient to withstanding him (Sambhaji Angrey) for, I assure Your Honour that he is a stronger enemy than you and a great many others think.' With the collapse of the Mughal empire, the Siddis were also lying low and, except the English, there were not many who could challenge the Marathas. Haider Ali of Mysore was a military genius. He created order out of chaos and raised a disciplined and powerful army. At that point of time, there were only two national powers - the Marathas and Haider Ali - who saw the cloud of danger rising from the *Diwanis* of the east which was soon to engulf the entire country.

Warren Hastings, the first Governor General, had to face many dangerous combinations. He was a controversial figure and opinion about him vary from total condemnation to fulsome praise. When Wellesley came to India as Governor General in 1798, the Mughals were nowhere active. There were only three powers in India: "the Maratha Empire covering the west and central part of India; the Nizam of Hyderabad, whose territories covered the tablelands of the Deccan; and Tipu Sultan who ruled over Mysore in the south."⁵⁰ Wellesley with the help of the Hindu dynasty whose

territory Tipu had usurped, dislodged the Sultan and brought the forces of company close to the Maratha homeland.

By a *coup d'etat* in Hyderabad, the Nizam was brought to his knees. The Governor General's brother Arthur Wellesley - the future Duke of Wellington - destroyed the Maratha forces at the field of Assaye in 1803 in the Deccan, and Lord Lake routed Scindia's northern army at Laswari. In 1818, the English company had become 'the paramount power' in India, holding as its direct territory, the Gangetic Valley up to Delhi, the Maratha homelands in the Deccan, the littoral of the Arabian Sea and the coastal strips extending from Bengal to the south. But most of the interior of India was still under princes.

As the last flicker of a dying flame, the final determined effort was made in 1857-58 by the old ruling classes, the Marathas and Mughals, to throw out the British. After the battle of Buxar fought in 1764, the Great Mughal had already become a pensioner of the East India Company. In the war of 1857 - called by British as the Indian Mutiny and by Indians as the First War of Independence - the Mughal King was only a titular head, a rallying point.

The active part was played by the Marathas under Nana Sahib, the last Peshwa, Tatya Tope and the Rani of Jhansi. The fire ignited by Mangal Pandey of Meerut, soon became a conflagration. After eighteen months of desultory fighting, in 1858, the Maratha leaders and their Hindu and Muslim compatriots were crushed and the British Government directly took over the administration of India. On 1 June 1874 the charter of the East India Company expired and thus "one of the most extraordinary organisations, the world has ever known, had come to an end."⁵¹

The End or Beginning

The English who were the last to enter the arena of Indian Ocean as mere trading merchants, played their cards with such fine finesse that after two hundred and fifty years, they handed over a mighty empire to the British Government. The company "had come to buy and sell, and it found itself achieving a tremendous piracy. There was no one to challenge its proceedings. Is it any wonder," asks the well known British historian, H.G. Wells, "that its captains and commanders and officials, nay, even its clerks and common soldiers, came back to England loaded with spoils?"⁵² It was a strange situation where the English Parliament ruled over a trading company which in turn "was dominating an empire far greater and more populous than all the domains of the British Crown."⁵³

It will be generally agreed that the historic achievements of a company of merchants would not have been possible without the help of a powerful naval force. The first seal of their naval supremacy was stamped soon after their arrival in 1612 when they routed the Portuguese - till then considered unassailable in an open sea battle. They went about systematically controlling the main sealanes by taking Ormuz (1622) in the west, dominating entrance to the Persian Gulf. After taking over Malacca in 1759, they marked their presence in the Far East where Indian Ocean merges into the South China Sea and the Pacific Ocean. Through tact and diplomacy they made use of Dutch to destroy the Portuguese in India and befriended local rulers to break the trade monopoly of the Dutch. That left only the French as the potent contenders for Indian trade. But their position on the mainland of Europe had become precarious

after the Seven Year War. They did not enjoy the same support from their superiors in Europe as did the English.

In dealing with the local rulers, only those foreign powers counted who had strong shipping. Initially, when the Portuguese arrived, the Indians were taken unawares. By 1498, the unity of India had been completely shattered by the depredations of the Sultans for over a thousand years. The Arab conquest of Sind in 712 was a non-event. The plundering campaigns of Mahmud of Ghazni lasted from 1000 to 1026 AD followed by over thirty Sultans. The Bahmani control over Deccan lasted between 1477-81 and on the eve of the entry of Portuguese, Deccan was divided into the kingdoms of Berar, Bijapur, Ahmadnagar and Bidar. It was only in the south that the Zamorins and other petty kings had a semblance of some power. The Portuguese came to west coast and from there spread to the East.

The Dutch first established themselves in the East and then moved towards the West. Indians took some time to assimilate what was happening and for about a hundred years the Portuguese had their way. By the time the Dutch reached south India, the supreme sway of the Portuguese had already been curbed. The Indian rulers in availing of the help of Dutch in ousting the Portuguese did not exercise adequate precaution. It was only Marthanda Varma who sized up the situation properly. Without a single sovereign power, it was not possible to deal adequately with the foreigners. He therefore first consolidated his position in the south and secured the cooperation of those who did not directly come under his control. He completely curbed the political interference of the Dutch in Indian affairs, repudiated all obsolete treaties, broke down their trading monopolies, purchased

peace by offering them baits, and compelled them eventually to carry on commerce as it should be done.

The English appeared on the scene during the reign of Jahangir. For him and his successor Shahjahan, some victories in riverine battles in the eastern sector were the acme of their achievements. They did not think of raising a strong navy. At that time, even the English did not know that Dame Luck will be so kind to them. But since the English had begun by setting up a factory at Surat in Gujarat, and from there penetrated further into the east, the scene of action for quite some time shifted to the North. When Aurangzeb ascended the throne, the English had started asserting themselves and Sir Josiah Child could even think of waging a war against the Mughals. The English suffered an ignoble defeat but even then Aurangzeb did not wake up to the developing danger and did little to strengthen his naval power.

The Maratha leader, Shivaji, was one Indian leader who was fully conscious of the power of a strong navy and set about building it brick by brick. He was a match to the Portuguese and fought running naval battles with the Siddis who commanded the Mughal navy. After Aurangzeb, came the deluge. The Mughal viceroys in various provinces of the country began to strut like sovereigns. The Rajputs had been alienated by Aurangzeb and withdrew into their own shells.

The southern unity suffered a set back; Haider Ali and his son Tipu Sultan were the only patriots. Thus the English saw a golden opportunity to play one against the other, buy those who were open for 'sale' and browbeat the recalcitrates.

The few patriots preferred death to defeat. The Marathas and the titular Mughal head fought till the bitter end. Most of Maratha leaders, including the Rani of Jhansi - 'the only man' - died on the battlefield and Bahadur Shah Zafar was banished to Rangoon where he died craving for just 'two yards of land for his grave' in his mother country, India.

CHAPTER VIII

Shipbuilding and Instrumentation

The available material to reconstruct the story of shipbuilding in India is very meagre. We have therefore to take the help of archaeological, artistic, literary and numismatic evidence to form an idea of how ships/boats were like during the ancient period. One painting on a potsherd excavated at Mohenjodaro dated circa 3000 BC looks like a riverine boat with an oar attached. Another potsherd picture of the same period could be that of a sea-going vessel. At Lothal excavation site, Rao has found a few terracottas of boats of which at least one, he thinks, could have been ocean going. (see picture)

Among literary references, the earliest are found in the *Rigveda* which is said to have been composed not later than 1500 BC. The *Jātaka* stories about the life of the Buddha, or his earliest incarnations, give graphic descriptions of many sea voyages. The *Arthasāstra* of the fourth-third century BC gives extensive details about the organisation of shipping industry but does not mention much about the art of building ships.

The Hindu caste system could have been one of the contributing factors for lack of material on boat building. It was, and is, considered below the dignity of a Brahmin, a Kshatriya, or even a Vaishya to follow the profession of making boats. This job was generally undertaken by lower

caste people who were illiterate and could not record the technique they followed. Even today, the boat-builders of Bombay and the Konkan coast (at Karwar), who were interviewed, cannot read or write.

Artistic Representations

The earliest representation of a boat or ship—both terms were interchangeable in earlier times—in sculpture is on the gateways of the famous stupa of Sanchi and the Amravati friezes pertaining to a period around second century BC. A lot of material is available about the ships and the building techniques in use on Southeast Asian seas. We know for certain that Indians reached that region in the beginning of the Christian era, if not earlier. The people whom Indians met there were not savages, but surely the immigrants had a superior culture. It is probable that most of the vessels built there after their arrival would have been borrowed from the design of Indian ships. It is not to deny mutual exchange of ideas in this regard, and use of traditional techniques by immigrant Indians based on indigenously available materials.

The ships portrayed in the fresco paintings of Ajanta caves are generally accepted as ocean-going. Those were painted between 200 BC and 800 AD and deserve a detailed discussion. The *Yuktikalpataru*, a compilation in Sanskrit of Raja Bhoja of Dhara who ruled around tenth century AD, is perhaps the only book which gives extensive information about the timber to be used for shipbuilding, types of cabins, and categories of ships mainly according to dimensions - length, breadth and height. As pointed out by S.Q. Fatimi of Pakistan, the knowledge of present day sailing ships could be put to good use in reconstructing their past. In this regard, NISTADS (National Institute of Science, Tech-

nology and Development Studies) teams have done a lot of good work.

One Japanese sailor seriously involved in the subject, thinks that ocean-going ships were being constructed in India over four thousand years ago. Maritime contacts between India and other countries of the region in 3000 BC naturally presume that ships were being built much earlier. The design and whatever technology existed at that time must have taken a thousand years to evolve and develop to be good enough to undertake ocean voyages. Akira Iwata, the Japanese sailor, is a member of the 'Association for the Restoration of the Sumerian Ship.' It is on the basis of remarkable similarity between the techniques of building ships at Sumer and Kozhikode that Iwata thinks, those ships were made in India. The Sumerian clay tablets of the time of Sargon of Akkad (2350 BC) mention that ships from Telmun, Makkan and Meluhha were moored outside the capital city. Bibby and Wheeler identify Telmun or Delmun with Bahrain and Meluhha with the Indus Civilization. Kramer thinks Dilmun stands for Indus valley and the Kathiawar coast, the land where the Sun rises.¹

Teak grows profusely on the Ghats all along the western coast as also in Panchmahal district of Gujarat. It was transported in bulk to the neighbouring country of Mesopotamia as "ruins of Ur have shown traces of Indian teak wood."² This proves that India-made ships were big enough to carry heavy cargo like logs of wood. This teak has been found not only in the palace of Ur Bagash but must have been also used for making ships. Panini (fifth century BC) has mentioned a variety of woods used for shipbuilding. These include *amra* (*mangifera indica*), *Sāmali* (*Bombay malabaricum*) and *khadira* (*acacia catechu*). It is well known

that Alexander in the early fourth century BC got his fleet constructed in the Punjab of *deva dāru* (deodār).

Even today the boat builders of Mahim in Bombay are executing orders for huge boats received from West Asian countries. “These boat builders have no sketches or drawings of the boat they are making. Everything is in their mind. Whether they are making passenger boats or cargo or fishing trawlers, each has a special shape and design. The racing boats of Kerala for instance are over a hundred feet long, and the builders have to work according to certain specifications which, in their case, are never put on paper. It is all in the mind. Some families in West Bengal utilize some Sanskrit stanzas to guide them while constructing *dhow*s. The formula is never put down on paper, and is passed on from father to son.”³ Hence the absence of written material on shipbuilding in India. The cut and dry formulae are transmitted intact from generation to generation for millenniums. The entire design is executed with dexterous fingers and when the boat or ship is put to water, it glides like a swan.

If history is a hard taskmaster and wants facts to substantiate what is stated, it will have to take cognizance of oral traditions which have been very strong in India and should be accepted in support. There are plenty of Sanskrit *slokas*, or brief verses in Indian languages in all the maritime states of India, which contain the principles of basic boat design, and have yet to be compiled. Suffice it to say that ships were made and sailings undertaken long before writing was known or records were maintained. The wooden ships of a bygone age could not have survived the ravages of seawater for so long as to have been retrieved from the bottom of the sea through marine archaeology of modern times.

The earliest proof of shipping and shipbuilding in India can be traced to the third millennium BC. Says Rao, Lothal was not only a port but also a shipbuilding centre. "Teak was used for this purpose at Lothal in 2200 BC and can be judged from the charred wood specimens found in the dockyard."⁴ Since it has not been possible to reconstruct even a poor model of a ship from the remains, we cannot be quite sure what these charred wood specimens total upto. Other varieties of timber were, he thinks, imported from the west coast ports of South India.

Literary References

There are repeated references to shipping, and obliquely to shipbuilding, in Buddhist literature like the *Mahāvamsa*, the *Pitākās* and the *Jātakas*. The earliest of the Buddhist texts which refers to sea-voyages is the *Baveru Jātaka*. Although this *Jātaka* (stories relating to the earlier births of the Buddha) is assigned to the fourth century BC, the folk tales on which it is based have a much earlier origin, some of them going back to the seventh century BC. The *Janaka*, *Vālahassa*, *Samudda-Vaniya* and *Sankha Jātakas* refer to ocean-going carriers capable of accommodating hundreds of passengers and crew.

A Buddhist text known as *Sinhalāvadāna* mentions that Prince Vijaya and his seven hundred followers banished by Simhabāhu, King of Bengal, set sail from the mouth of the *Ganga* and came to Ceylon on the day of the Nirvana of the Buddha, that is 543 BC. There are many works in Sanskrit like *Raghuvamsa*, *Ratnāvali*, *Kathāsaritsāgara* and *Panchatantra* which speak about maritime trade and commerce. The *Sangam* works of South India, particularly *Silappadhikaram* and *Manimekhalai* give vivid descriptions

of the ships, ports, emporia and even the names of articles traded.

By the time of the *Arthasāstra* (fourth-third century BC) shipping activities had assumed such proportions that the entire industry had been reorganised on 'scientific' lines. Since ships were made of wood, provided with masts and sails, a *datrarasmigrāhaka* is mentioned as a member of the crew who was engaged in rigging, hoisting and bringing down the sails. An *utsechaka* was employed to bail out seepage water. It is probable that the shipping organisations that followed, drew heavily on the list of officers mentioned in the *Arthasāstra* to run the industry. Ibn Majid in his *Fawa'id* mentions most of those crew members though not so comprehensively. The admiralty of Akbar may have borrowed the organisational structure from *Fawa'id*. Their crew also included a *gumti* who "throws out water which had leaked through the ship" (*Ain* 26).⁵ It shows that even during the days of Akbar, the wooden ships were subject to seepage of sea water. In the reign of Mauryas, Samudragupta had undertaken extensive naval conquests. He took "the then popular east coast route and subdued all the powers of coastal Andhra right upto Kanchi and asserted his influence on Sri Lanka too."⁶

From the navigational terms available in *Namalinga-nusasanam*, also known as *Amarkosa* of Amarsinha datable to about the fifth-sixth century AD, we learn that "some form of hollow area below the deck," *Kūpaka*, was provided for keeping odd things like oars and buckets. The term *pota* is used for ship as has been explained by Kshīrasvāmin in his commentary on "*Amarkosa as Pavate - vātena - potovāhanam* i.e. a carrier which is driven by the force of wind which clearly shows that the term *pota* stood for a larger boat with sails."⁸

Joshi thinks “that use of sails in boats for which there is earliest evidence in some of the antiquities pertaining to Indus Valley Culture was not very popular in the early historical period. Neither Panini nor Kautilya,” he adds, “refers to this feature of ships.”⁹ It is also absent, he observes, in the depiction of boats in Bharhut and Sanchi “Indian sails were most probably of triangular nature. It is on this account, that the term *Karanadhāra* (*Karna* is hypotenuse) was used for operator of sails.”¹⁰ This is a very significant observation as far as the history of shipbuilding is concerned, because according to Hourani “lateens are not native to India...”¹¹ The lateen is a triangular fore-and-aft sail, typical on the Arab vessels. “A term *ardhanāva* referred to by Amarsimha may indicate one of the twin boats joined together to form a ship.”¹²

Ships in Indian Art

The “earliest representation of a boat of historical times is to be found on a medallion from Bharhut and is datable to second century BC.”¹³ It shows two boats with three sailors in each, one of the sailors is shown being swallowed by a sea-monster while others seem stunned. The boats are shown made of planks joined with dowels and could not have been ocean-worthy. In Sanchi, the front face of the south pillar of the eastern gateway and the south face of the north pillar in the western gateway area also depict what look like riverine boats. According to Fathulla Khan, the eastern gateway sculpture represents “a canoe made of rough planks rudely sewn together by hemp or string...” The boats are elaborately decorated and do not carry more than three persons. At Amravati is shown a different type of an oblong or rectangular barge which has flat bottom with several supplicants standing before an empty throne.

There are several representations of ships in the fresco paintings of Ajanta caves, the noteworthy ones being in Caves I, II and XVII. One feature of these ships is that they are all ocean-going. Secondly, almost all of them are three masted. Thirdly, they exhibit the artist's expression of his ideas about ships and not true-to-life depiction of a particular ship. The artist had drawn heavily from a written account of an event. Fourthly, it follows that the depiction dates back to several centuries after the event actually occurred and does not refer to the contemporary period. What is more important is the event, its importance and the impact it made on the mind of an artist even hundreds of years later. The artist tried to reproduce that event as best as he could out of his imagination and creative skill. It may not be justifiable to regard the artistic representation of Ajanta ships as replicas of the real vessels.

The Cave I series on the left hand side of the main hall, as so far interpreted, form a part of the Mahajanak legend. On the right, a king is sitting in a ship and nearby another ship is sinking in the waves. Dieter Schlingloff identifies this painting as Kalyāṅkārins Adventures. The story takes place "in three spatially unconnected areas and not arranged according to a time sequence."¹⁴ In the first we see Kalyāṅkārīn on his ocean voyage to the land of jewels. The picture in the upper right and corner shows that the journey was a success and two men are carrying caskets perhaps full of jewels. To the left, there is a graphic representation of a shipwreck. The ship is sinking into the waves, the stern still towers up out of water, a drowning man is stretching out his hand for help, and he is in imminent danger of being devoured by sea monsters. The fish are dancing upon the waves and the bits of shipwreck are floating on the ocean. The painting is a piece of art and highly emotive. The painter

has been very successful in depicting the secrets of the sea, the roll of the waves - you may almost hear the roar - and the helplessness of the hull to waves and wind breaking it up like a tiny twig. As to the ship type, Griffiths likens it to 'the heraldic lymphad type of *madhyamandira* described in *Yuktikalpataru*.'¹⁵

In Cave II between second and third cell door of the right corridor, the Bhavila's ship is tossing on a stormy sea. Poor Bhavila is looking towards heaven in a prayerful mood. a massively built ship follows having three masts carrying a lugsail, perhaps at the divine command, to rescue Bhavila. The jib is well-filled with wind, a pair of steering oars hang in sockets. One new feature shown in the ship is a lip-like projection at each end which certainly adds to the beauty of the ship but might have been useful for steering at a higher speed. Schoff says: 'In the cave paintings at Ajanta, commemorative of the visit of a Persian emperor in the early seventh century, a ship is shown which if not a junk is manifestly influenced by that type of vessel.' Joshi also thinks that the ship because it shows rectangular sails "may not be of Indian origin."¹⁶

Prof. Needham refers to this drawing and reproduces a tracing of the ship from the reproduction of Yazdani & Binyon. On the authority of Hadi Hasan he says the ship "may be identified with the one bringing Persian ambassadors to the court of Pulakesin II of the Deccan just before 628 AD, and the painting would not be long posterior."¹⁷ But no one so far "has ventured to be very positive as to what country or nautical tradition it represents."¹⁸ Our view is that the Ajanta paintings of ships may not be actual renderings but are artistic expression of an event and may as well have combined the ship construction features and nautical traditions of several countries.

In Cave XVII, the entire middle part of the wall to the right shows the scene of the landing of Prince Vijaya in Ceylon with his land army and fleet dominated by his installation on the throne. The ships are carrying elephants and horses and would have been big enough to accommodate them. But the artist, intent on conveying maximum details of the event in the minimum space, has drastically cut down the size of the ships. What is worthy of note is that all the ships of Ajanta are three-masted which is “particularly significant in view of the fact that in the entire region of Greek (*sic*) and Rome and the Near East, right upto the Middle Ages, the only ships were those with a single main mast... Andhra coins,” adds Schlingloff, “dating from the beginning of the Christian era as well as a relief from Aurangabad show two-masters whose masts are supported by stays. The sailing vessels in the Borobodur reliefs also possess twin masts.”¹⁹

A temple in South India is named after ‘boat’ and is called Tōniappar and belongs to seventh-eighth century. It is situated at Sirkali, a coastal town about twelve km. from the port city of Poompuhar. The main tower of this temple has sculptural specimen of a *toni*, i.e. a boat, with a clean visible structure of rudder and side planks with Lord Siva and Parvati. The temple name is derived from the boat model and is a unique specimen in the whole of Tamil Nadu state. The earliest name of the present city Srikali is also mentioned as Tonipuram in one of the earliest inscriptions found in the same temple. More *toni* sculptures in relief are found on the pillars and good paintings of *tonis* on the inside walls speaking about the popularity and importance of boats and ships in Tamil Nadu during those days. The *toni* sculpture on the top of the *gopuram* is said to be an ocean-going vessel.²⁰

Yuktikalpataru

The only extant book on the subject of shipbuilding was compiled in Sanskrit by Raja Bhoja of Dhara who ruled around tenth century A.D. Called *Yuktikalpataru*, the work was first noticed by Prof Aufrecht in his *Catalogue of Sanskrit Manuscripts* and brought to light by Radha Kumud Mookerji in *A History of Indian Shipping* published in 1912. *Samarangana-sūtradhara* is another Sanskrit work compiled by the same Raja Bhoja about that time. Basically this book deals with town planning and architecture but it has one chapter on *Yantra-vidhana* mentioning fundamental principles of making many instruments including ships. *Yuktikalpataru* mentions four types of timber for making ships which, interestingly, correspond to four *varnas* - *Brahmin*, *Kshatriya*, *Vaishya* and *Shudra*. The best ships are made of *Kshatriya* class of timber which is light and strong. Other kinds of timber do not last long, they soon rot in water and are liable to split at the slightest shock, and sink.

Bhoja divides vessels broadly into two classes: ordinary (*samanya*) and special (*visesa*). “Chaudhury’s interpretation of *samanya* type as river-going and *visesa* as sea-going is wrong,” comments Dr Bag, “for it is clearly mentioned that all *samanya* type vessels except *manthara* are *ambudhagati* (sea-going).”²¹ Both the types are further subdivided mainly on the basis of dimensions - length, breadth and height. The ordinary type has ten varieties depending on dimensions. The special class is categorised into *Dirgha* and *Unnata*, the former being further subdivided into ten and the latter into five subclasses. The dimensions of various types given below are based on the paper by Dr. Bag;²² these are all in cubits, (one cubit is equal to 18 to 21 inches.)

I. Sāmānya (ordinary) vessels - Ten varieties

Names of Vessels	English equivalents	DIMENSIONS (in cubits)		
		Length	Breadth	Height
1. Kṣudra	small	16	4	4
2. Madhyamā	moderate	24	12	8
3. Bhīmā	formidable	40	20	20
4. Capalā	move to and fro	48	24	24
5. Pātālā	with covering	64	32	32
6. Abhayā	fearless	72	36	36
7. Dīrgha	tall	88	44	44
8. Patraputā	like folded or doubled leaf in the form of a cup	96	48	48
9. Garbharā	with inner compartments	112	56	56
10. Mantharā	curved	120	60	60

II. Viśeṣa (special) vessels

A. Dīrghā (length main feature) - ten varieties

Names of Vessels	English equivalents	DIMENSIONS		
		length	breadth	height
1. Dīrghikā	tall	32	4	3
2. Tarani	moving hither and thither	48	6	4
3. Lolā	64	8	6
4. Gatvarā	perishable	80	10	8
5. Gāmini	going and moving on	96	12	9
6. Tari	running swiftly	112	14	11
7. Janghāla	128	16	12
8. Plāvini	flowing over	144	18	14
9. Dhārini	power of possessing	160	20	16
10. Vegini	move with speed	176	22	17

 B. Unnatā (height main feature) - five varieties

1. Urdhvā	elevated	32	16	16
2. Annurdhvā	non-elevated	48	24	24
3. Svarnamukhī	golden faced	64	32	32
4. Garvini	power of being filled with	80	40	40
5. Mantharā	curved	96	48	48

Some of the ships had cabins. *Yuktikalpataru* mentions three types of vessels based on cabins (*mandira*). *Sarvamandira* had the largest one extending over the entire area used for transport of royal treasure, horses and women. *Madhyamandira* vessels had cabins in the middle meant for use by kings for pleasure trips. *Agramandira* vessels had cabins towards the prows used for long voyages, or war. According to Rao “even the Harappan ships had cabins as indicated by the seal engravings and terracotta amulet from Mohenjodaro.”²³ In Sanchi sculptures and some of the Ajanta paintings of ships, a cabin can be made out.

Evidence of Explorers

The remarks of Jordanus about Malabar ships, “nor are the vessels ever decked over but open...”²⁴ do not seem to be quite correct, although Duarte Barbosa and Varthema also make similar remarks about Malabar ships soon after 1500 AD. On the other hand, Buzurg talks of cabins or *balanj*. Nicolo Conti who visited India in the early fifteenth century and saw some Indian ships, “so built in compartments that should one part be shattered, the other portions remaining may accomplish the entire journey.”²⁵ He adds: “The natives of India built ships larger than ours, capable of containing 2000 butts with five sails and as many masts. The lower part is constructed with triple planks in order to withstand the force of tempest to which they are exposed.”²⁶

Another explorer, Marco Polo, who came to India in the late thirteenth century, is a keener observer and gives detailed information on Indian ships which throw much light on the technique of shipbuilding. He says: "the ships are all double-planked, i.e., they have a course of sheathing-boards laid over the planking in every part... They have a single deck, and below this space is divided into about sixty small cabins, fewer or more according to the size of the vessels. Some ships of the larger class have, besides the cabins, to the number of 13 bulk-heads or divisions in the hold, formed by thick planks let into each other (*in castrati*, mortised or rabbeted)." ²⁷

About caulking, he explains that it is done with quick lime and hemp cut in small pieces, pounded together, mixed with oil of a tree, making of the whole "a kind of unguent, which retains its viscous properties more firmly and is better than pitch. With this, the bottoms are smeared." ²⁸ The globe-trotter adds: "After a voyage for a year or more, a ship is given a course of sheathing over the original boarding, forming a third course, which is caulked and painted in the same manner as others." ²⁹ Repairs are repeated "even to the number of six layers, after which she is condemned as unserviceable and not sea-worthy." ³⁰

A Ship Takes Shape

Ships are constructed to sail on seas. Each sea in addition to having the common element of water, differs in many ways from place to place. The ships which sail on the Arabian Sea, cannot traverse the reef-choked Red Sea. The ships wafted by Monsoon winds, which glide over the open Indian Ocean, may not as easily pass through the narrow sealanes of the Strait of Malacca and Indonesian archipelago comprising over 3000 islands. Secondly, the locally avail-

able shipbuilding materials play an important part in the making of a ship.

If the teak of India is considered to be one of the best, if not *the* best, for making ships then the neighbouring countries of West Asia might import teak logs but the distant European shipwrights may have to set up shipyards on Indian coasts. But they may not make their ships the Indian way and will introduce their own technology as also certain tools and implements not in use in India. Although the sailors are generally conservative and follow their own traditions, but Indian craftsmen who work under the guidance of foreigners are likely to pick up some of the good points after this exposure and contact.

In this regard, the remarks of Prof. S.Q. Fatimi of Pakistan as cited by Lotika Varadarajan are of great significance. He says: "In matters concerning shipping and shipbuilding, it is an axiom that every country develops the boat that is the most suited to its natural conditions which, of course, must include the character of the seaboard and the weather."³¹ Fatimi also draws attention to the fact that if ships belonging to one power have to traverse different kinds of seas, "the tradition itself adapts and becomes heterogeneous."³² The Arabs for example, used stitched boats for coastal and fair weather sailings but preferred to use "strong, nailed, clamped and well-caulked ships for sailing with the south-west Monsoon."³³

The ideas about shipbuilding gathered from artistic and numismatic representations - and from specimen in various museums have to be supplemented by the shape of wooden boats and ships in use today in various maritime states and oral traditions prevalent there. The Wadia shipbuilders who

began building ships at Surat and then shifted to Bombay, turned out as many as 350 vessels over a period of a hundred and fifty years, till 1837. In 1829 was built the first steamship *Hugh Lindsay*, also at Bombay Dockyard, and within a decade, the first iron-ship *Planet* was launched at Bombay.

The oldest wooden vessel afloat today was built for British at the Wadia dockyard in 1817. Made of teak and first called *HMS Trincomalee*, it was renamed *Foudroyant* and is being used as a seamanship training ship since 1897 lying at her moorings in Portsmouth Harbour, England.³⁴ (see figs. 5 & 6) Once the steam-and-steel ships appeared on the scene, the importance of wooden ships began to decline.

Selection of Timber

Apart from the basketwork boats covered with skin and caulked, used in Egypt and Sumeria from the earliest times - which were unfit for ocean-voyages - timber has naturally been the most important component of a boat or a ship. Some of the Egyptian boats made of wood with two cabins and a tall pole in the centre “were dealing with foreign ports (as) is clear from the emblems on the poles...”³⁵ India was fortunate in having a vast variety of timber suitable for shipbuilding.

In western Himalayas at three to four thousand feet was the pine known in India as *devadāru* (deodar) “tree of gods”. South of Vindhya, the entire Deccan plateau, particularly the Western Ghats, were buried under forests, the most conspicuous feature being the lordly teak, “king of timber”³⁶ thriving best at three to four thousand feet. It is not very hard, is easily worked, and has great elasticity and strength. It answers the requirements of the *Kshatriya* class of wood of

the *Yuktikalpataru*. The insects and sea borers do not affect it. An East India Company official, James Kyd, in a letter to Admiral Drury written as late as 1808, while discussing the quality of various timber - *saul*, *sissoo*, teak - opts for the last and says Malabar teak is certainly the best timber in the world of building ships. Bengal has the '*Sundari oak*' which is so hard that ordinary cannon fire, they claim, cannot make a hole into it. The point to note is that in the initial requirement of timber for shipbuilding, the entire country is very rich and can take pride in having teak as its home.

Once the timber is selected, depending upon the type and purpose for which it is meant, the logs are sawed into planks of the required thickness and length. Some wood is used for making ribs generally 3" x 3" which are fixed to the keel which is usually 9" x 9" as I saw at the Mahim boatbuilding yard in Bombay. In some places the plank are kept in shade for drying for a few days. Some sailors first put them under muddy water for three to four weeks for 'seasoning' and then they are dried in shade. The ribs in most places are boiled in Honne or any other vegetable oil of groundnut or cashew, or made out of vegetable seeds, in south India and on the entire western coast, according to Dr. G. Victor Rajamanickam, principal investigator of NISTADS project. This imparts extra strength and flexibility to the ribs and also protects them from insects and wood-borers.

Planks are not boiled, only oil is applied on the foreface and are heated to get resistance against insects and give the required bend on them. Even today this practice continues on the western coast as explained and shown to me by Francis and Peter D'Mello. Their forefathers since ages had been following the same practice. The keel is generally of one piece but in case of longer boats/ships, two pieces are

joined and to give it further support, 'Keelson' is used on the top. If the keel is 9" × 9", the Keelson is generally 3" × 13". The stem and stern posts are fixed to the keel with proper reinforcement. The stern is generally rectangular in shape having an angle ranging from 105° to 115°. In modern times nuts and bolts are used for fixing the stem.

On Karwar coast, the boats are generally without a keel. The boat I saw, being built had a hollowed log of *amba* (mango) as the base, 1½ feet wide at the centre. There were eight cross planks at one metre interval, the longest crosswise being in the centre. The hollowed log was fixed with two slanting planks on either side about one foot wide supplemented with another 8 inches plank. The first two planks had an obtuse angle of about 120° to 130°. The stem and stern were both pointed and sharp as in many earlier Arab boats, for the rest, there was a gradual curve. The planks were sewn throughout at a distance of 5 inches with coconut coir and fixed with wooden nails to make them more secure.

The entire boat was caulked with fish oil mixed with *Kapus* (cotton waste) and *chunam* (lime) alongwith some other ingredients. This material is called *chandras*. In the centre of the boat, more than 25 feet long, was *vastman* for fixing the mast called *kauta*. On one side of the boat were six *mangte* for fixing *dandu* (oars). The other side had only two for balancing, fixing or tied with coir ropes. Sewing was also done in the centre crosswise to make the boat stronger. Fish oil is applied to the *donay*, as the boat is called, on both sides before rains. (see pictures).

Further south, fish oil is not generally used, and the boats are not pointed. Another feature was that most of the

boats sailing on the sheltered waters surrounded by Anjediv islands had outriggers 12 feet to 16 feet long and joined by another log at the other end. At times, a man sat on one side perhaps to balance the boat. (see picture showing outriggers). Tukaram, the sailor, said they did not use iron nails for two reasons: one, they rusted soon; two, it added to the cost.

A boat like that earlier cost them about Rs. 3000/-, now it was four times more. The investment was generally recovered in one to three years' time mostly through fishing, and the boat, if well maintained, lasted for twenty years or more. On asking whether they went beyond the islands in the open sea, he confirmed they could safely go upto twenty to thirty km or even more.

Tools & Implements

In establishing the antiquity of boatbuilding, the timber was there from the earliest period, but the question arises how the trees were cut, planks sawed and ribs made? Just as there were forests on the planet, there were also mines of various metals. Not only the mountain ranges extending from Anatolia, Armenia to Afghanistan were rich in metal, many regions in India, like the mines of Khetri, had several metals. What is more important is the smelting technique of various ores.

Some smelting equipment has been found at Tal-i-iblis in Mashiz Valley datable to *circa* 4000 BC. A sudden afflorescence of metal is reported at the DK-mound of Mohenjodaro alone. "Mackay found 14 spearheads, 64 knives, 23 axes, 2 swords, 53 chisels, 11 fish-hooks, 2 saws, 18 razors, 17 arrowheads and many other artifacts in

Harappan culture.”³⁷ The use of “twisted drill was known to the shipwrights of Lothal as early as 2200 BC.”³⁸ They were “the first to invent and use it for boring holes in hard wood and metal.”³⁹ This tool was “made of bronze.”⁴⁰ The range of metal implements discovered shows that a number of other instruments though not found on site were also in use. Prof Needham goes to the extent of commenting “... it is quite clear that the history of science and technology in India will bear comparison with that of all the other ancient civilizations...”⁴¹

Masts and Sails etc.

In Kerala, according to NISTADS investigators, boats built today are of several types: (i) dug-out where a single log of wood is scooped out in the middle, and is used in lakes and lagoons; (ii) plank built; (iii) stitched-plank built; and (iv) nailed plank built. Plank built are very huge in size used mainly for fishing, transporting and ferry service. Almost all are keel-less but the bottom plank is called as *e:ra:e:va:vu*, or keel. Its general name is *vallam* and *vanchi*. It is further classified as stitched plank and nailed plank and given various names to various varieties used for different purposes. Except for *patte:ma:ri*, *charakku vallam* and *ke:vu:vallam*, all other stitched plank built craft are keel-less manufactured by using coir, and now by synthetic ropes.

Chundan Vallam is about 65 feet long and goes upto a distance of 40-50 fathom deep sea. Its interior, nearly 5 feet wide has several compartments, each separated by a bar. *Muri vallam* is used in Quilon and Trivandrum districts. *Pattema:ri* has a capacity ranging from 10 to 200 tons and has traditionally four sails. The *Uru* craft is specially made for the Arabs and is also known as *sambok*. It may be 110 feet long or more, the total planks on one side are 30, keel

and ribs are well-supported. The keel is generally 14 inches in thickness and has about 65 ribs. It is purely a nailed plank built boat not used in any part of Kerala but only sent to Arabs. Kerala's unique race boat may have more than a hundred rowers at a time. Kerala has very hoary traditions of boatbuilding and most of the types of boats found in Southeast Asia may be similar to one or the other of an Indian boat/ship. (specimen of some South Indian boats may be seen in figures 7 to 9).

The number and height of masts depend upon the size of the vessel. India was using upto five masts in the early Christian centuries when in Europe there were only one-masters as late as in the fourteenth century. The masts are always erected on the keeled base as they have to carry sails, ropes, braces etc. The *Milindapanho* belonging to third or second century BC mentions that the mast was so high that a ladder was used to climb it for the lookout man. The same is said about a mast described in *Sāṅkha Jātaka*.

In the reproduction of a ship from a freize of Borobodur, a rope ladder going up to the mast can be clearly seen. The Andhra coins depict two masts so spaced as to keep balance. The ships painted on the walls of Ajanta or shown in relief in Borobodur are all multi-masted. *Yuktikalpataru* does not mention many details about masts on Indian ship. But it does say, we do not know for what reason, that if a vessel has four masts, it should be painted white, if three masts then red, and yellow or blue if it has one or two masts.

About the sails, there is no standard type which may be said to be common throughout the country. India with as many as eight maritime states is almost a continent and a variety of forms are expected. Usually, it is found that

rectangular or square sails are raised by the sailors. The artistic representations also point in that direction. The main purpose of the sails is to receive wind and impart speed to the ship. In many ships more than one - upto five - can be seen. They are placed in such positions that the impact of the wind is fully utilised. As the direction of the ship or that of the wind changes, or higher or lesser speed is required, the sails are likewise manipulated.

Prof Needham gives the sails of fourteen varieties - alongwith their line drawings. He defines sails "as pieces of textile fabric held outstretched upon ships in various ways so that the pressure and flow of the wind can be utilised to drive the vessel upon its course."^{41a} The square sails which are generally used in India are the "oldest and simplest, symmetrically hoisted with or without a boom."^{41b} "The square-sail," he adds, "is the only principal sail which always receives the wind upon the same surface."^{41c} The earliest Egyptian ships had square sails, so had Indian ships.

The learned author says in notes, "The square-sail runs through the whole of nautical history from ancient Egypt to the clippers. It is, as Casson has said, 'without a peer for voyages, especially long ones, made with a following wind. It offers every inch of its surface to the winds thrust, the vessel rides comfortably and safely, and the canvas needs a minimum of handling.' Moreover, a square-rigged ship "can hoist twice the sail area," adds Needham, "of a fore-and-aft rigged one, which is very valuable in light airs, and chafing does not occur since yards and sails strain away from the masts."^{41d} Sometimes it becomes necessary, especially in less developed types of vessels, to hoist and lower the sails again, each time the vessel goes about. In India whereas the square or rectangular sails are more common

called *addapāi*, but triangular sails, known as *kalupāi* are also seen.

The size of the sails depends on the dimensions of the vessels. They are generally 35 feet in height and 16 feet in width. When wind force is less, the *geeb* sails which resemble the lateen sails, are introduced. Whereas in China and some places in Southeast Asia, mat-and-batten sails are in use, the Indian sails are made of cotton cloth. In order to give extra strength to the sail cloth, it is soaked in a thin paste of tamarind seeds.⁴² In Kerala, catamarans use a single sail, triangular in shape. In northern region of Kerala usually three sails are deployed.

The vessels unfurl sails while moving in mid-ocean so as to utilize the maximum wind force. From the earliest days of sailing, it was found that “since one could not proceed directly into the wind, one must approach it by a series of passages as near the wind as possible”⁴³ and this zigzag movement is called tacking. But the movement of turn varied with various types of sails. For example, square-rigged ships could not tack and had to ‘wear about’ by turning the stern to the wind.

Anchors were used to keep the craft in a particular position. The earlier ones were made of stone. Single-hole and three-hole huge anchors of various shapes were found during the marine archaeology of the Dwarka region. These can be seen at the National Institute of Oceanography at Goa. *Milindapanho* mentions two qualities of an anchor: it fastens the ship and keeps it still even in the mighty sea; two, it does not float, but sinks down, and even in water a hundred cubits deep, holds the ship fast and brings it to rest.⁴⁴

Sewn-plank Boats and Ships

Where and when the ships were nailed and where they were stitched is a matter of controversy. Copper was known in India at least in 2200 BC. The Hittites are credited with the invention of iron through the ore-smelting process. The technology reached India around seventh century BC and had become quite popular by the fourth century BC. The earliest boats and ships in the world therefore would have been of the stitched variety right from the wicker basket-boats of Egypt stitched over with hide to the earliest stitched-plank boats of India, Arabia, Indonesia and Malay archipelago. The most common stitching material was coconut coir. The coconut tree is “native to Southern India, Indonesia, Ceylon, the Maldives and Laccadive Islands.”⁴⁵

It is well established that the Indians reached Southeast Asian region in the first century AD, and may be earlier. They established kingdoms in Cambodia, Sumatra, Java, Borneo, Celebes and other places. The ships in which they reached there after an arduous journey carried their camp-followers and army/naval personnel. Their ships were made of sewn-planks, had three to five masts and an equal number of sails. Certainly the culture of the immigrants was far superior and Kaundinya, who founded the Cambodian empire, was well received by the local inhabitants.

Dr. Manguin speaking about the trading ships of South China Sea in the first millennium AD, refers to the earliest sources of Kun-lun Chinese authors who say that the ships which then visited Chinese harbours took Buddhist pilgrims on board enroute to Srivijaya and India. Kun-lun says: “The large ones are more than fifty metres in length and stand out of the water four to five metres... They carry from six to

seven hundred persons with 10,000 bushels of cargo.”⁴⁶ The Kun-lun account continues, ‘The four sails do not face directly forward, but are set obliquely and so arranged that they can all be fixed, in the same direction, to receive the wind and to spill it.’

Admiral Paris gives a detailed plan of a fishing boat of the Bay of Tourane (*Da-nang*) : “Its hull was basically made of five planks: a flat bottom one, plus two on each side (with smaller wash-boards at stem and stern). It had no frames. The planks were joined edge-to-edge assembled by means of wooden-dowels inserted into their seams and fastened with rattan stitches.”^{46a} The description of the Paris boat is very similar to the boats of Karwar - flat bottom, two planks on each side, but in Karwar the planks are stitched together, as in Southeast Asia, and not joined with dowels. Dowelling was also done in India and one painting of a ship in Ajanta clearly indicates tennon-and-groove system. In Bombay yards at Mahim and Versova, planks of the boat are inserted into a wedge or groove made into the other plank and inserted into each other along with cotton soaked in caulking material.

Speaking about the boats of Borneo, Rev A. Horseburgh gives a long description which very well fits in with the catamarans of Kerala and Tamil Nadu coasts. As quoted by Dr. Manguin he says: “The ordinary boats of the Dyaks are long, narrow canoes, hollowed out of the trunk of a tree, the sides being raised by planks pinned upon them...they place the edge of each plank upon the ledge of that immediately below it, lashing them both firmly together; and when they have in this manner put on as many planks as they wish (generally 4 or 5 on each side), they caulk the seams, so as to render the boat water-tight. Hence, in the construction of

their boats,' and this is important, 'they not only employ no nails, treenails, or bolts, but even no timbers - nothing but planks ingeniously lashed together by rattans, and then caulked.'⁴⁷

Lotika Varadarajan identifies three sets of maritime traditions in the Indo-Gangetic estuaries and Peninsular India - "the coir sewn tradition of the Arabian Sea/East Africa, the *jong* tradition of Southeast Asia impinging on Bengal and, perhaps Orissa; and, connected with the *jong* tradition, is the aspect of the Austronesian/Indonesian tradition, of outrigger boats and construction devices such as the lashed-lug."⁴⁸ She further clarifies, "These three constituents could be stated to form the basis of boat building techniques of the Indian Ocean, as indeed, also those of India."⁴⁹

All these traditions, Lotika seems to suggest, started elsewhere and were later adopted by Indians. But in the light of antiquity of Indian shipping and shipbuilding stated in the previous chapters, it is also possible that some of the boatbuilding traditions originated in India and were carried from here to the neighbouring countries on the east and the west. We may surmise that sewn-plank ships and four or five masts and sails were the unique features of the early Indian ships. When these ships reached the shores of Southeast Asia and other countries, the sailors and shipwrights of those places adopted those characteristics with local modifications.

India is known to have been all along rich in all types of shipbuilding materials not only in Sind or Gujarat, or the western coast, but almost in all maritime states. Therefore shipbuilding has been a flourishing industry in various parts

of the country from remote antiquity. This is amply confirmed by current oral traditions and the type of boats/ships presently plying in various Indian waters. Even today, Arabs get their vessels made by Indian craftsmen on the west coast. It shows that Indian expertise in the art of building ships has continued unbroken down the ages. In the thirteenth century, Marco Polo paid fulsome praise to Indian shipbuilders.

A Venetian traveller, Cessari Di Fedorici, writing in 1565 stated that there was so much abundance of materials in India that “the Sultan of Turkey found it cheaper to have his vessels built in Dacca than in Alexandria.”⁵⁰ Sultan Ghiyasuddin Iwaz Khalji employed *Kaivartas* of Gaur in Bengal “for building boats on the basis of daily wages.”⁵¹ There were a large number of shipbuilding yards at Dacca, Jessore, Hughly, Balasur, Murangi, Chilmari, Karibari, Trimohani and Garhgaon. Pratapaditya got his boats built of *Sundari* oak “by far the best for the purpose” and claimed to be “more lasting in water than teak wood.”⁵²

The local people had a vast variety of boats, warships, and floating batteries, each suited to perform a specific function. The Jessore boats included *dingi*, *pansi*, *balam*, *bachari* and *bachariship*. Among war vessels, *ghurabs*, with a row of cannon mounted, were the most popular. Others included *gallivat*, *piara*, *machua*, *bachariship*, *balam* and fast moving *kosa*. The swift *sips* were meant for communication purpose and *jungi* for carrying heavy cargo like elephants, horses etc.

When Thomas Bowrey visited India in 1670, in addition to these boats, he also mentions *boora*, *budgaroo*, *olosako*, *purgoo*, *rhatgiri* and *salb*.⁵³ The war boats of Ahoms were constructed like *kosas* for towing *ghurabs* and floating

batteries. The prow and stern of Assamese *kosas* had two projecting horns. The poop (*sar*) and keel of *bachari* was made of one flattened plank, the poop being extremely high. Each *bachari* was manned by 60°-80° sailors. Ahom war boats were known for durability and strength.

There was no end to the variety of Mughal boats. Mir Jumla, for example, had a flotilla of war boats, *kosas*, *jalias*, *ghurabs*, *parindas*, *bajras*, *patellas*, *salbs*, *pitals*, *bhars*, *balams*, *khagiris*, *mahalgiris*, *palwars*, *khelnas*, and so on.⁵⁴ The most important ships of Maghs were *khalus*, *dhums* (which were bigger than *khalus*) and “*kartus*, filled with guns.”⁵⁵ The Feringhi vessels were small, their prows low but poops extremely high, and had no keels. For naval operations they used swift going galleys or galliots having 15-20 benches on each side, able to accommodate about a hundred persons.

The contacts of the people of Kalinga (modern Orissa which has now lesser land area) with Ceylon were not confined to the fifth century BC alone. Samudragupta travelled down south through the eastern seas and had his fleet made in Orissa. There were shipbuilding centres at Tāmralipti, Camara, Poduca, Sopatma and Kaveripattinam. The shipbuilding traditions continued during the medieval period and the naval exploits of the Cholas far beyond the borders of India have been already referred to.

On the west, apart from the Harappan and post-Harappan ports and shipbuilding centres, in the middle of the seventeenth century AD, the English Company at Surat had adopted the practice of getting their small vessels constructed in India.⁵⁶ This was the beginning of the Company's Mercantile Marine. After a Concordat was signed with the

Portuguese in 1635, the Surat Council was able to utilise “larger shipbuilding yards at Bassein, Daman and Dahanu in place of smaller ones at Navsari and Gandevi. In 1640, they had a small fleet of country-built ships and frigates, the latter being manned by small guns.”⁵⁷

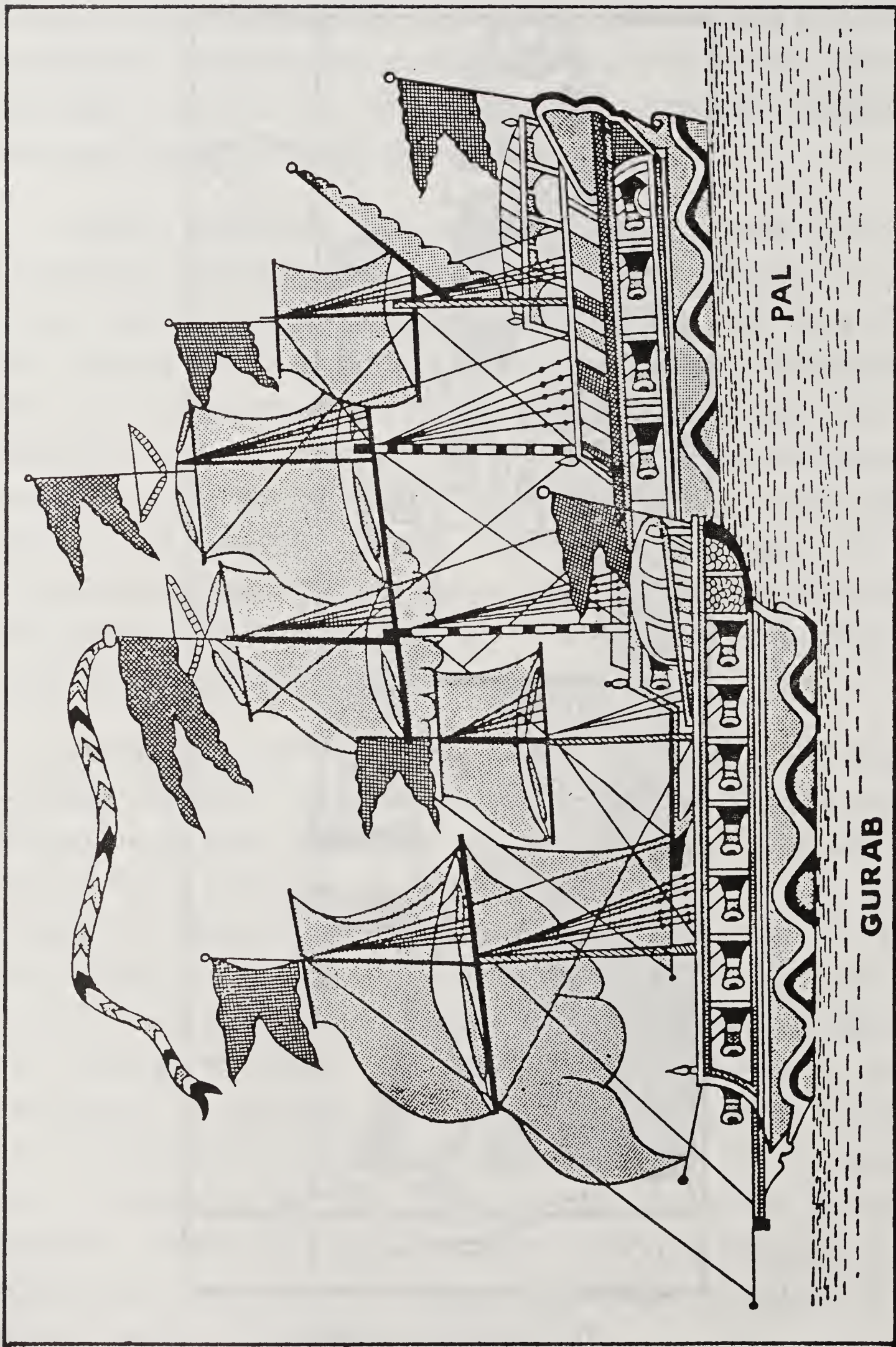
Further south of Gujarat, the Konkan coast had a flourishing shipbuilding industry and “contributed greatly to the art of shipbuilding and sea trade”⁵⁸ from 1500 to 1670 AD. During these one hundred and fifty years, the Marathas and the Malabarais tried to modernise and modify their ancient traditional vessels. They coveted the sheen and shine - and above all the superb performance - of the Portuguese ships which splashed the sea. Their form and frame, their ropes and rigging, and the gospel of guns they proclaimed with precise marksmanship, all made a deep impression upon the Indian merchants and sailors.

During this period, Thana coast was famous for ship building industry. Large ships were made at Agashi and Bassein and their hinterland was rich in teak. “The ships built at these places made voyages to Europe. In 1634, the English had four *pinnaces* built there for coastal trade.”⁵⁹ Till the advent of Portuguese in 1498, the Indian vessels built on traditional pattern were quite good for high sea voyages. The tonnage of some was far higher than those of the foreigners, as much as 1600 tons. Vasco da Gama’s first fleet varied between 50 and 200 tons only. But the size was soon increased to 600 and 700 tons, and later more. It was, however, found that smaller ships carrying cannon and armament which had to be engaged in warlike activities, had greater manoeuverability.

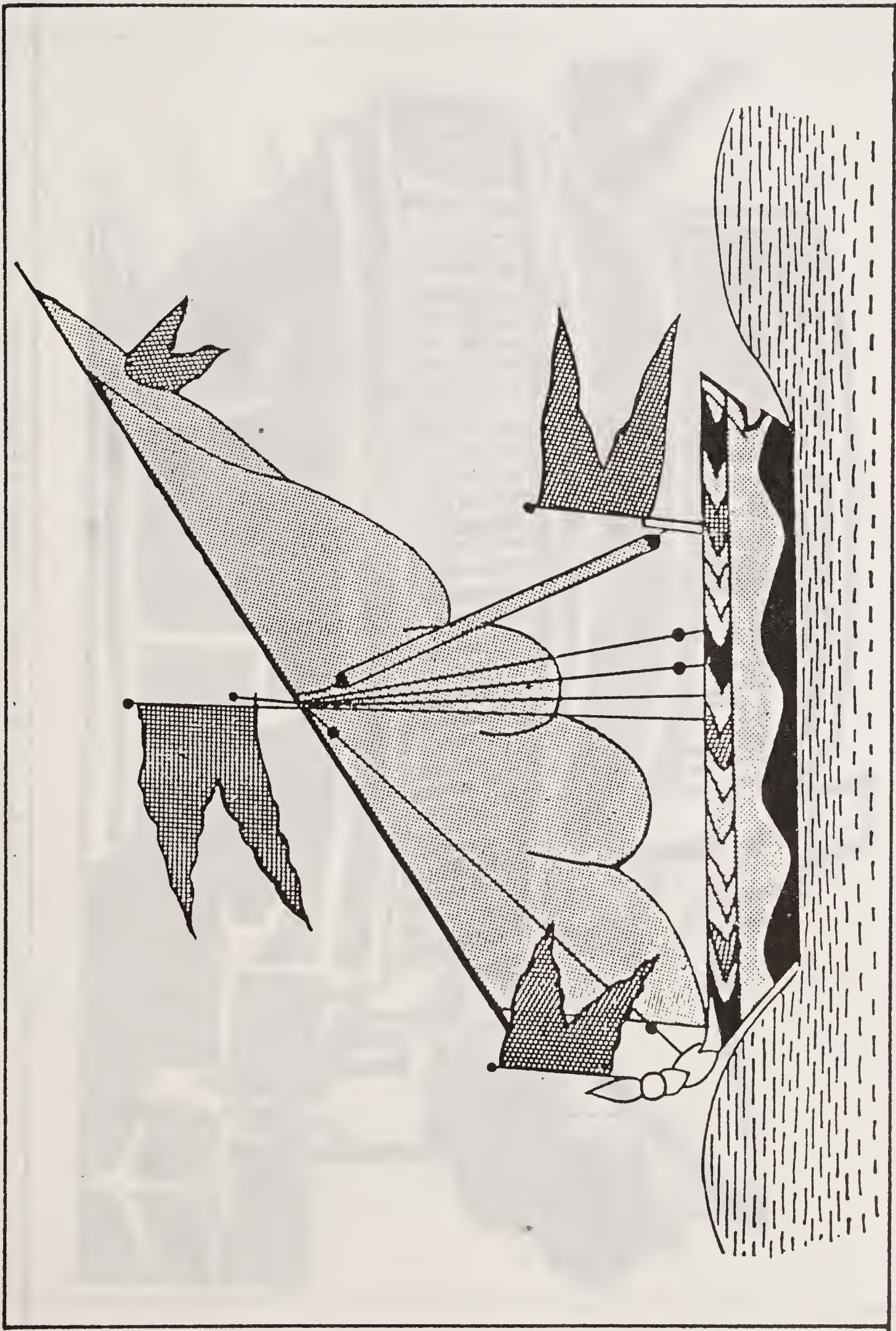
The traditional Indian ships in ordinary use had the planking sewn together with coir-thread and had tapering



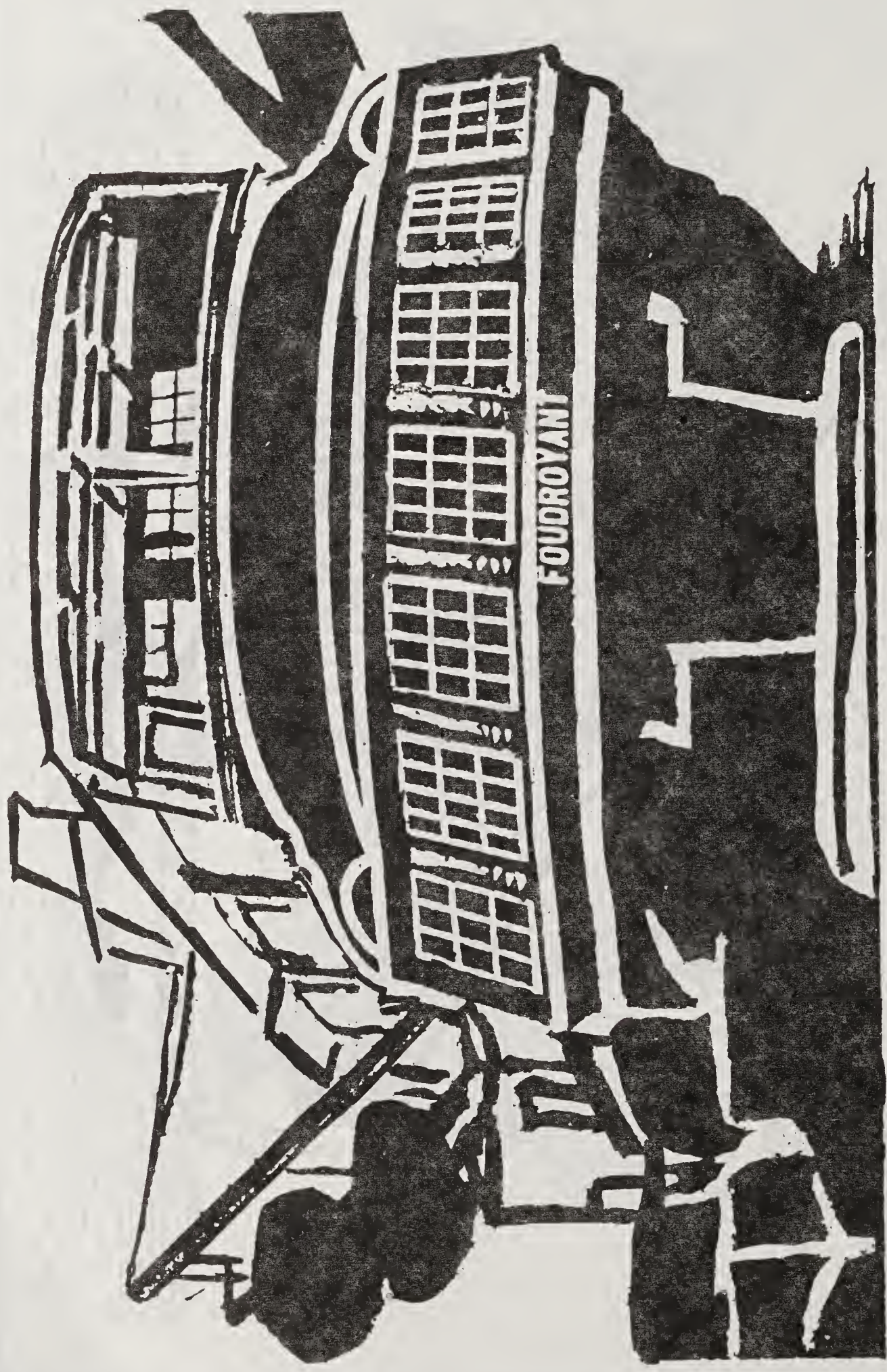
The Chaldean god Oannes



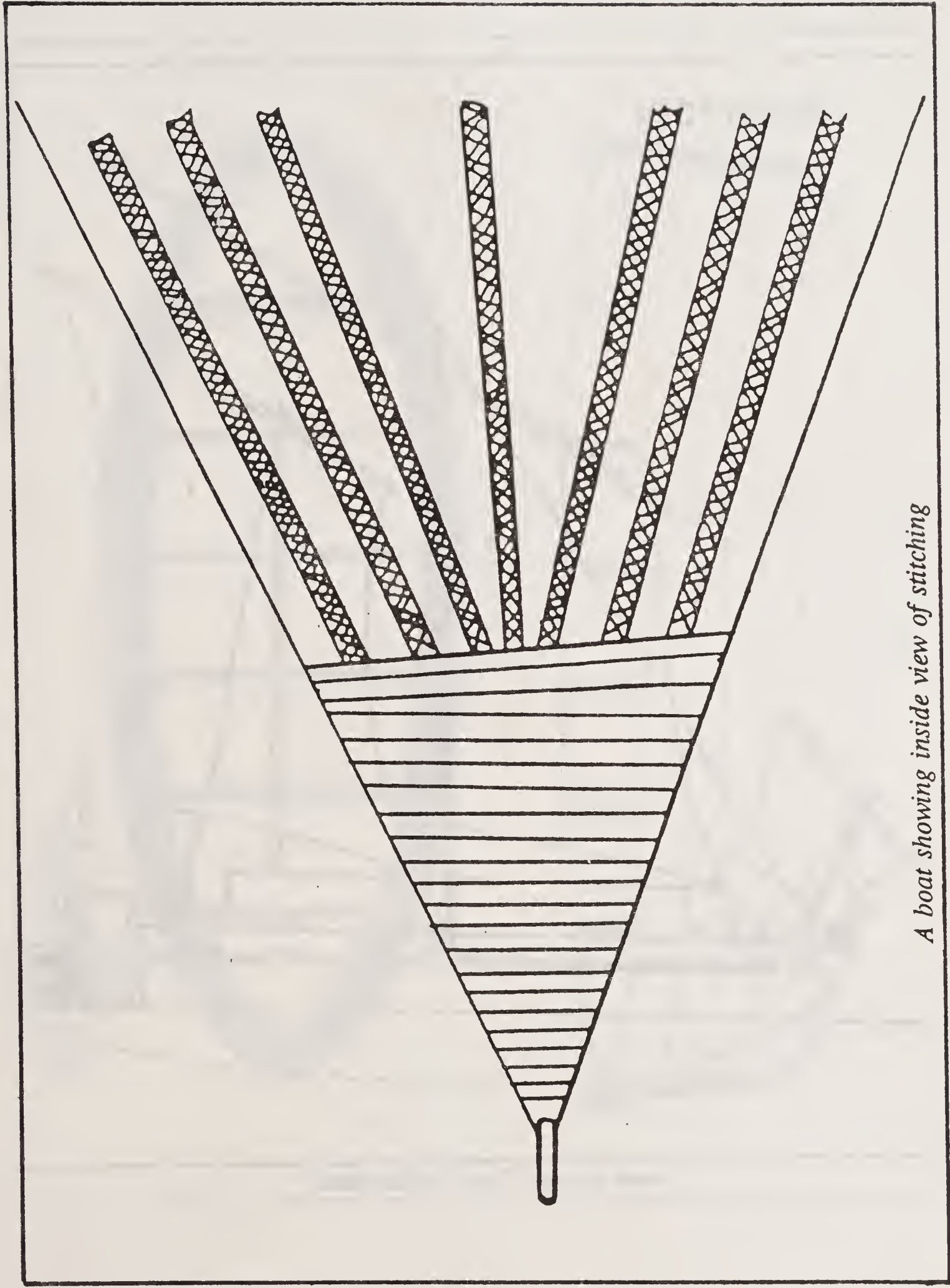
Shivaji's gurab and pal gunboats



Shivaji's galbat

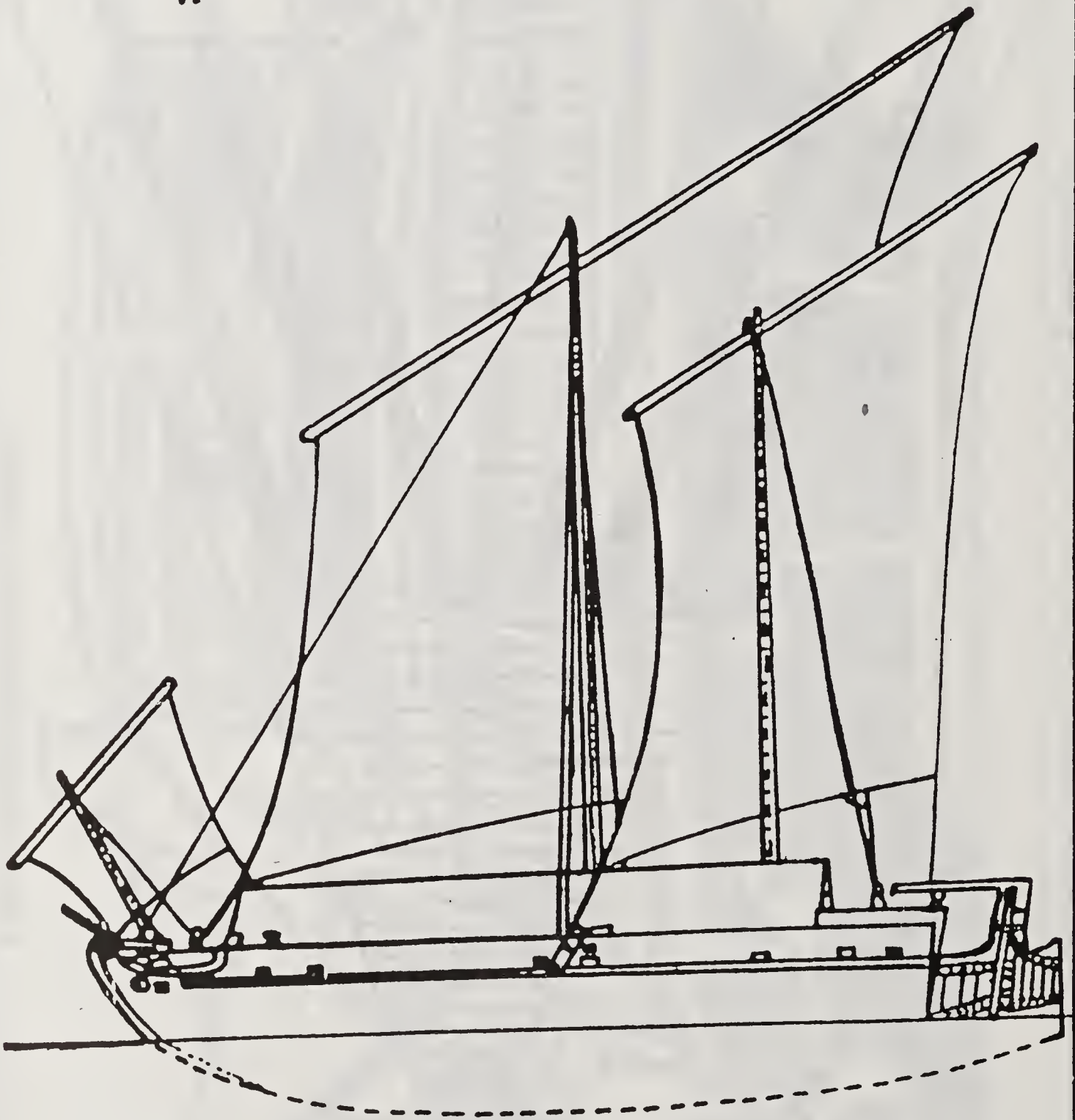


Bombay Dockyard's Trincomalee (renamed Foudroyant)



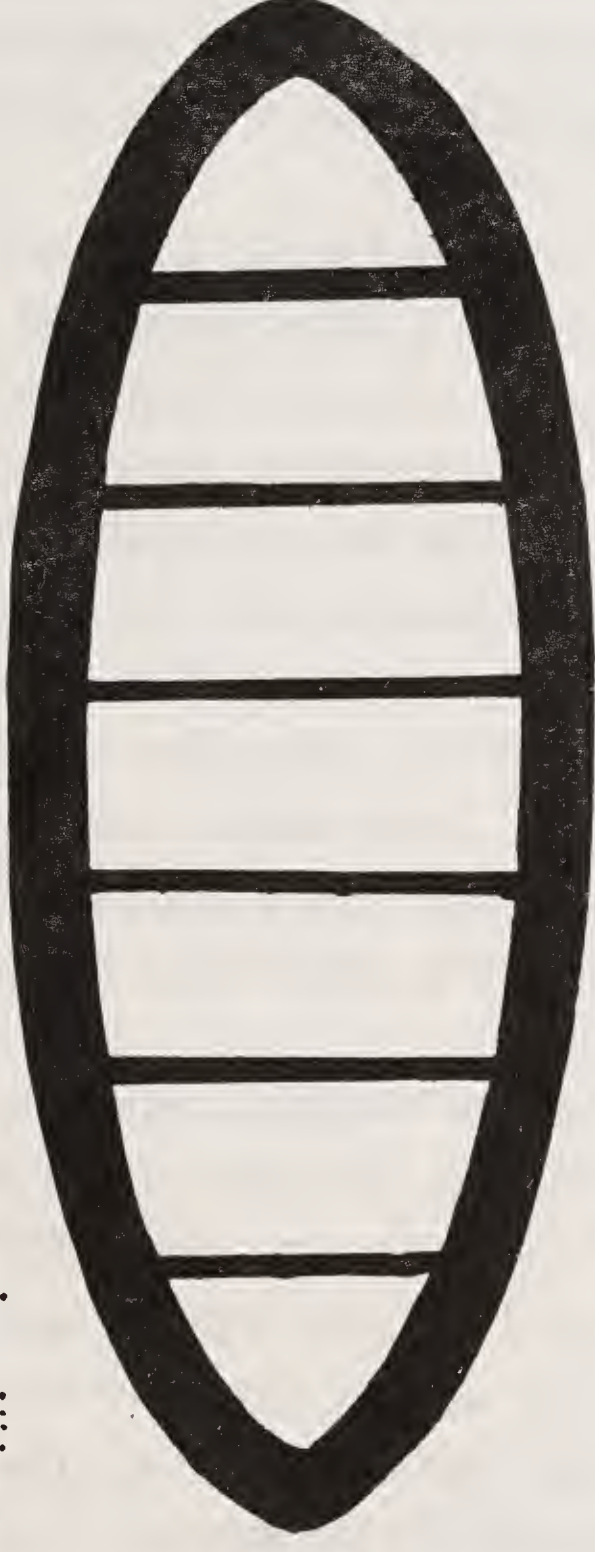
A boat showing inside view of stitching

Kalla tōṇi

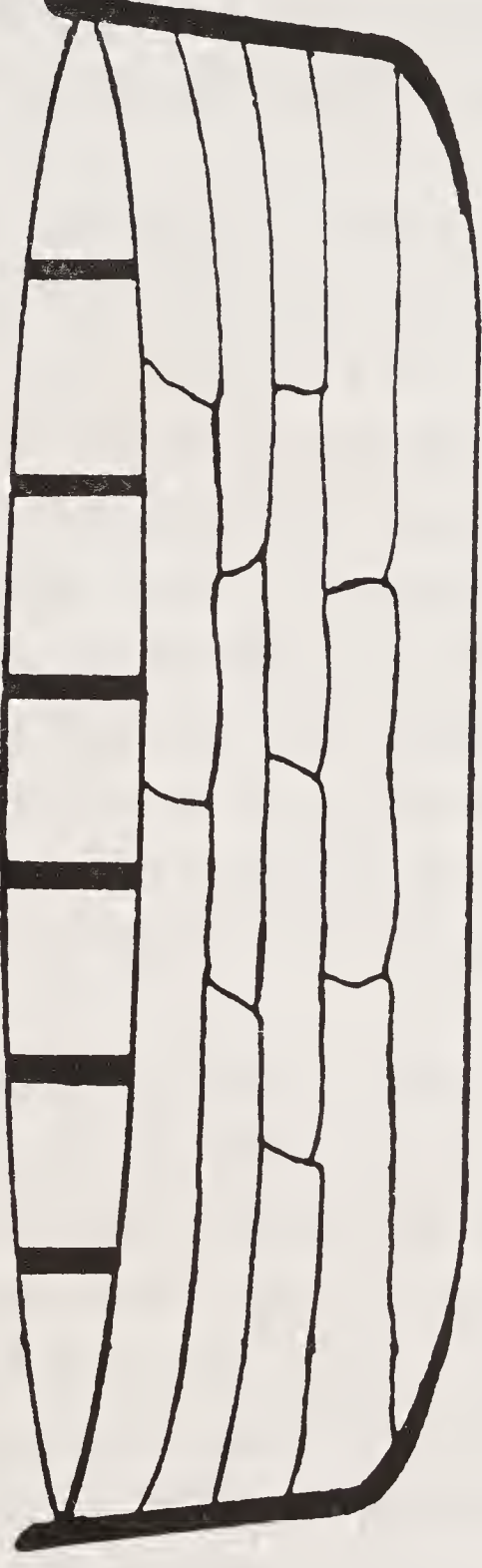


Some typical South Indian boats

Plank Built Boat.
Kaṇṇāṭṭṇi-Cuddalore.



Top View



Side View

bottoms. They had also introduced the use of nails and planking was secured with nails having broad heads rivetted from inside. The planking was covered with thick cloth pitched with bitumen mixed with fish oil and coconut oil. Inside, there were chambers for cargo and no decks. The palm roofing protected the ship from rain and was stretched over with cane mats so strong that men could walk over it.

The large mast had two ropes running on either side, one at the prow serving as a stay and two hillaards that came to stern to hold the mast. The yard was slung in a way that one-third portion stretched in front of the mast and the rest behind. Likewise, the sail came two-thirds behind and one-third in front. The tack of the sail at the bow was made fast to the end of the sprit which was as large as the mast which enabled to bring the sail forward so that the ship could be steered close to the wind. The rudder was very large hinged by ropes which were outside the ship. The anchors were of hard wood and stones were tied to the shanks for sinking.

Goa was another important shipbuilding centre. Although the Portuguese occupied it in 1510, they found that “the carpenters and caulkers of the Bijapur King had built ships and galleys after the Portuguese model” and when they set up government in Goa, they found that twelve large ships had been constructed after their *Flora da la Mar*.⁶⁰ The other important innovation which was introduced here and there was the adoption of square rigging. Of smaller vessels, the Portuguese had caravals and galleys, and Shivaji while building his warships kept their good points in mind.

Shivaji's war vessels, according to Krishnaji Anant Sabhāsad, included *gurab*, *tarande*, *taru*, *galbat*, *shibad*, and *pagar* to which Malhar Ramrao Chitnis added *machava*,

bathor, *tirakati* and *pal*.⁶¹ Angre's warships were also equipped with a military band to inspire the crew. "The *gurabs* and *galbats*" says Dr Apte, "had all the essential features of warships. A long projecting streamlined prow easily cut its way through the water... securing good speed. As these vessels were broader in proportion to their length, they naturally obtained greater buoyancy... they had forty to fifty oars, and steering was affected by a rudder slung to the stem-post... Every oar had a row-lock, or a thole which made propulsion easy."⁶²

After the arrival of the English, the Marathas had greater choice in designing ships. Most of the Angrian warships were constructed after the English model. In performance they could easily take on English ships as is evident from the title of an eighteenth century contemporaneous book carrying the facsimile entitled, *Maratha Grabs and Gallivats Attacking an English Ship*. The Maratha warships, unlike the English ones, were of low build. They carried one to three masts and all carried a row of guns in the broadside. The Maratha three-master *galbats* had square sails, and two-master, lateen sails. The prows carried a jib and the masts were perpendicular to the hull of the ship. They had eight or more guns having projecting prows, portholes and guns. The one-masted ships had a vast lateen sail spreading along the yard. These sails were half-set and cordage was secured by pulleys - another innovation - to the right-hand side of the mast.

In some *galbats*, the rudder handle was astern. The upper rim of the hull and its lowest part touching the water carried beautiful designs in black and white colours. The keel, outer planks and other parts exposed to sea water were made of teak. The ribs and beams in the upper structure of

the hull used jack-fruit, mango or *undal* wood. The hull was usually secured by coconut coir. "The *phatemar* of the late nineteenth century had iron bolts in its structure... *Undi-nut* or fish oil was used for the hull."⁶³ The *gurab* being larger than the *galbat* was equipped with topsails and top gallant sails. The ships bore interesting names like *Rajahams*, *Narang*, *Samsher* and *Sadashiv*. The Bharat Itihasa Samshodhaka Mandala of Poona have a chart of coloured ship-drawings of the Angres in their collection. The chart delineates about thirty ship-drawings of which three are English and the rest of Angres.

The Bombay Dockyard

Soon after the arrival of European powers in India, the foreigners started visualising the possibilities of building their ships here. There were all the basic inputs for building a ship - plenty of timber, cordage, gums, resins, cloth-and all of the best quality. Above all, there were plenty of craftsmen who had been building boats for thousands of years even with the help of second class tools and technology. A return voyage from Portugal to India took about eighteen months. Initially, the Portuguese decided to keep a fleet in India at a suitable site from where the ships went to West Asia and Southeast. Once they firmly settled at a number of ports and de Almeida established Portuguese Government at Cochin, he set up shipyards at suitable places and began building ships in India.

When the English set their feet in India "shipbuilding was in a flourishing state," says R.J. Wilkinson in an article published in *India* in March 1929. He adds, "ships were made in India and manned and navigated by Indian sailors and were sailing the Indian and Pacific Oceans in the centuries when the very existence of the country was almost

legendary in the Western hemisphere.” There was a chain of shipbuilding yards in all the maritime States, from Gujarat in the west to Bengal in the east. Verthema gives details of the materials, shipbuilders used and the method they employed at Calicut in the sixteenth century. He says “First they make their ships such as are open, each of 300 or 400 butts. They do not put any oakum between one plank and another but they join the planks so well that they keep out water excellently. They then lay on pitch outside and put in an immense quantity of iron nails. They also possess as good timbers as ourselves and in greater quantity than with us. The sails of these ships are made of cotton and at the foot of the said sails, they carry another sail and they spread this when they are sailing in order to catch more wind so that they carry two sails where we carry one...”^{63a}

The English East India Company was having their ships made at Blackwall more than any other yard. There were other yards also like those run by the family of Wells, Dudmans, Hill & Mellish, Bernards, Randall & Brent, and for ships of 1000 tons and more, Gravesend and others.⁶⁴ But by the end of the eighteenth century, timber shortage forced the builders to look elsewhere for supply. In the last years of the century, as the French wars caused great pressure on the dwindling English oak “the company’s fleet received a fresh infusion of quality with the introduction into the European trade, of ships built in India of teak - the ‘oak of Hindustan’... they were the product of superb craftsmanship combined with superior materials.”⁶⁵ These ships constructed at Bombay Dockyard “rivalled any in Europe”⁶⁶ which had a long history behind and replaced the dockyard at Surat.

As early as on 22 March 1660, Henry Gray wrote to the Earl of Clarendon proposing building of two brigantines at

Bombay. Consultations were held at Surat on 7 September 1668 where the advantages of shifting the shipyard to Bombay were discussed. It was also pointed out that building ships in India will be much better and cheaper. In October of the same year, Surat advised Bombay to procure timber from Bassein, Gandevi or Bulsar “where is the best and cheapest in judgement of the most knowing here.”⁶⁷

In 1685, John Child was appointed captain-general and admiral of the company’s sea and land forces. In the following year, the seat of government of the company was transferred from Surat to Bombay. The Public Department Diary VII A (1734) noted: “Experience has convinced us that vessels built here (i.e. India) of teak timber and according to the manner of Surat rabbet work are far more durable and proper for the climate than any that can be sent from Europe...”⁶⁸ But Bombay Council in their letter of 10 January 1736 asked Surat to send a good carpenter.

As a result of this, Lowjee Nusserwanjee arrived in Bombay and with that began the glorious chapter of seven generations of a single Parsi family spanning one hundred and fifty years well into the age of steel-and-steam ships. “Lowjee arrived in Bombay accompanied by ten Parsi ship carpenters - among them five Wadias, including a younger brother.” Wadia “is a corruption of the Gujarathi word for shipbuilder, *vadia*, but it was not until 1774 that this Parsi family adopted it as its surname.”⁶⁹

On the actual mode of building ships at Bombay, the most detailed account has been given by A.L. Mackonachie. An extract:

The bottoms of these ships are half as thick as those of the same kind built in England. The planks are

rabetted as high as the second or third plank above the bands. In the rabbet joint or seam is poured boiling hot dammer, a kind of pitch, then a covering of fine, clean cotton wool, and when the bottom of a ship is planted, it is difficult to perceive any seam. They are, of course, never caulked. The bolts are mostly square, and over their heads are laid a sort of composition to make the surface smooth; then a coat of chunam or lime mixed with hair over that sheathing of teak plank, then the blankets boiled in dammer or tar and over all the copper.”⁷⁰

The author estimated that “a teak-constructed ship of war would last 30 years against only 11 years, the figure stated in the report of the Commissioners of the Navy as the life period of an oak-constructed ships of war.”⁷¹ Regarding the cost, he estimated £ 14 or £ 15 per ton at Bombay to £ 17-17-6 in England. Lt. Col. A. Walker, however, thought that Bombay-built ships were 25 per cent cheaper than those constructed in the docks of England.

At the launch of the *Calcutta*, an 84-gun ship, on 1 March 1831, Sir Charles Malcolm, superintendent of the Indian Navy, said that “the dockyard had produced some of the finest men of war he had ever met throughout his career.”⁷² The *Asia*, 84 guns, was the flagship of Sir Edward Codrington at the battle of Navarino and afterwards the Admiral, Sir Pulteney Malcolm, wrote to his brother Charles “Tell my old friend, Nowrojee, what a glorious part the *Asia* sustained in the battle of Navarino and how proud I am of his success as a builder.”⁷³

The Bombay Dockyard and the Wadia Master Builders by Ruttonjee Ardeshir Wadia (1957 edition) gives a complete list of 366 ships - excluding boats and barges - built

at the Bombay Dockyard between 1736 and 1932 mentioning the type, guns, tonnage, ownership and the final fate. These included 39 naval vessels, 6 warships of 84 guns, 2 of 80 guns and 8 of 74 guns. Among these is the frigate *Trincomalee* of 1065 tons with 46 guns built in 1817, renamed *Foudroyant*, the oldest wooden ship afloat, and going strong.

Instrumentation

Once the earliest ships were made - a hollowed log, lashed together bamboo raft, vessel stitched or nailed, or both - the ropes rigged, sails set, essentials provided and cargo loaded, the captain had to decide which way to go to reach his destination. He knew the winds and, having meticulously watched their directions, had found out that they generally blew according to a regular pattern. He could therefore leave the shore and let the wind take his ship whichever way it was blowing. But may be, he did not want to go that way and was keen to steer his ship to a predetermined direction. In the earliest period he had fewer alternatives than to sail by Sun during the day and by stars during the night. Moreover, he had also to understand and appreciate the whims and moods of his ship, his mistress, respond to her requirements, caress, cajole and command her and, if it became inevitable, go down with her to the bottom of the sea like a loyal lover!

Watching the waning and waxing of the moon, he might have made notches on a tree trunk. That is how the science of astronomy was born—the timings of rising and setting sun noted and the phases of the moon put down in time. Over the years, the knowledge thus collected was composed in language and passed on orally from generation to generation.

The Indian Ocean region was unique not only in having a regular behaviour of winds but also very clear sky for

nearly six to eight months in a year when the stars looked as clear as crystal. For the months, when it rained, the ships were 'put to bed' and renovated for the next voyage. This close contact with nature and penetrating study of its behaviour had highly sharpened the senses of the people of yore. Extremely keen observation and the most sensitive senses of smell and hearing were the supplementary tools of the early sailors which seldom failed them. They could guess the depth of the sea by the colour of water, find out the distance from the coast and country by watching the sea-life. They could anticipate a reef or a rock by listening to the sound of the sea waves. They could almost smell land from miles.

In India, they compiled their astronomical observations in *Jyotish Vedānga* about the fifteenth century BC. By then the orbit of the moon was classified into 27 equal parts known as *naksatras* into which the zodiac circle was divided, each of 13 degrees 20 minutes. The Indian and Arab sailors made much use of stars in finding out directions in which their ships were required to go. The Indian mariners largely used the Polar latitude but they also measured latitude by the Sun. The method involves drawing a circle and fixing a pole in the centre. The shadow cast by the pole is used in calculating latitude. The chart and diagram, both by Kutchi mariners - reproduced here courtesy Maritime Museum of Bombay - serve to determine the solar latitude.

The method of calculation due to declination is slightly different in the northern and southern hemispheres. After running the ship to a certain distance, the position is again determined. It is called sun-run-sun. After traversing more distance, when the sun is at the highest altitude (which can happen when it is on your meridian: meralt), another set of

readings of the sun's azimuth and elevation yields its own latitude and longitudinal position, (sun-run-meralt). By these two simple methods, and even by their combination, (sun-run-sun-run-meralt) one can determine position of the ship provided, the initial position was accurately known.

The earlier mariners also utilised the sacred Calabash, specially used in Hawaii, to find out the latitude of the place. Calabash is a cup with two holes on either side and the third at a point through which the Pole star can be seen. The sailor keeps on rotating the cup in his hand till he is able to see the Pole star through the hole. By joining the point of this hole to the hole on the other side and forming an angle with the line of horizon, he gets an angle with the help of which it is possible to determine whether to go east or to west.

Prof Needham in Vol III of his *magnum opus* (*Science and Civilization of China*) gives a detailed diagram of the circles of the celestial sphere alongwith azimuth, declination etc exhaustively explaining the significance of numerous arcs and angles which help in fixing the direction of the ships by watching the stars. This came into use much later during the third and last stage of 'mathematical navigation'. The historian of science "who has to soak himself in writings belonging to the ages before the establishment of the heliocentric view of the solar system, may have to make a certain effort to recall that the 'sun's path' is only its apparent path, and that the declination circles of the fixed stars are only those in which they appear to move."^{73a}

Indian sailors of medieval times, in addition to 'running down the latitude' with the help of the overhead sun during the day, made use of *dhruva* (Pole star) *nakshatra* during the

night to sail to north or south till the latitude of the destination was reached. Once north was found, it was not difficult to find other directions. In the south, the sailors follow more than three stars during the night to fix directions. The mariner's compass was developed around 1300 AD in the Mediterranean world and "about the same time, the Arab and the Hindus also came to know of it, though did not make use of it."⁷⁴ *Matsya* or *Machch-yantra* for finding the north, which we have referred to earlier, "was in use among the Kutchi seamen till recently, and has been referred to by Lotika Varadarajan."⁷⁵ But no specimen is preserved anywhere for physical verification.

Winds, Currents

The sailors also made use of winds, waves, currents for the purpose of navigation. Wind not only provides energy to the sails but also serves as a compass for delineating directions. In Karnataka—generally in the entire south region—for example, eight types of winds are easily identified. These are :

North-south known as	<i>Vāda</i>
South-north known as	<i>Sōlavam</i>
East-west known as	<i>Koṇḍal</i>
West-east known as	<i>Kaccan Kōḍai</i>
North-west-south-east known as	<i>Vāḍakachohān</i>
North-east-south-west known as	<i>Vāḍakoṇḍa</i>
South-west-north-east known as	<i>Sōlavakachchan</i>
South-west-north-west known as	<i>Sōlavakoṇḍa</i>

Vāda appears in January to March and it affects navigation. *Vadakkaccān* is a symbol for an impending cyclone and other dangers. Each wind, likewise, has its own characteristics and periods of blowing according to NISTADS

researchers. Shipping till the end of the medieval period, to a very great extent, depended upon these winds called the trade winds. Abū Hanifa Dainūri, an Arab pilot of the twelfth century, mentions the names of twelve winds in his work on nautical science. Indian sailors also possessed a sound knowledge of the regular flow of Monsoon winds - said to have been first discovered by the Arabs - "without which the Harappan vessels could not have made regular voyages to the East African coast (Socotro), Egypt, the Bahrain islands and the Persian Gulf..."⁷⁶ The twelve winds mentioned by Dainūri "are included in the list of sixteen types of winds given by the *Āvasyakacūrni*."⁷⁷ (For windrose see Map VIII).

By just 'feeling' the wind, the sailors in the south, as also elsewhere in India, are able to form a fairly good idea about the weather. "The chilly *vaadai* from the north, and the pleasant *thenral* breeze from the south that the Tamils speak of, the *varsha katra* (the wind that brings the rain) from the south-west that the boatmen of Lakshadweep talk about, the *toofani suryo vara* from the east that the Kutchis mention are all of this nature."⁷⁸ An Indian sailor on the seas by the feel of the wind could guess which country it came from. "The Tamils speak of the *Malayala minnal* (lightning from Malabar-side), *Ezha minnal* (lightning from the direction of Ezham or Sri Lanka). A fisherman's folk song in Tamil mentions the violent *karai-kachhan* wind from the north-west that causes boats to collide and break apart in their keels."⁷⁹ Similarly, there are weather-beaten sayings and couplets in local dialects which succinctly sum up the nature of a particular type of wind. In Uttar Pradesh and Bihar there are many songs under the category of *Barahmasa* (twelve months) which mention weather characteristics of each month of the year.

Similarly in each maritime state, a few bright constellations are used in location fixing. "The Tamils speak of the use of *Vaadi-velli* (Pole star), *Kappal-velli* (Ursa Majoris, the four stars of *Saptarishi* group that form a square), *Araa-men* (Krittigai, the Pleiades) etc. The people of Malabar and Kerala speak of the use of the *Kasila-min* and *Palli-min* (of the same Pleiades group), the *Chemmeen* (Orionis) etc. An award winning film entitled *Chemmeen* mainly deals with the life-style of Kerala coast fishermen. The use of *Sodhi* (Swati, Arcturus-Bootes) is known in Lakshadweep."⁸⁰

Based on traditional observations of stars and their constellations, Indians drew compass-rose or star charts which served as ready reckoner for rhumb lines, stellar bearings, latitudes and distances of ports to the navigators sailing in mid-ocean. The celestial sphere is conceived as a circle in which both poles, north and south, position of the fixed stars and their east-west movement are marked. The fixed stars could be used as pointers to different directions towards the east while rising, and towards the west while setting. These directions provide rhumb lines for the sailor.

The Indian compass-rose used by Gujaratis has thirty-two such rhumb lines which are named after their corresponding stars. They are placed equidistant at an interval of 11° - 15° each. The stars are recognised by symbols commonly understood by Kutchi navigators. The distance mentioned on the rhumb lines in *Jam* or *zam* indicates the longitudinal distance per degree between the latitudes of the two rhumbs. This distance is proportionately larger between the latitudes near the equator.

When Vasco da Gama met a Gujarati Muslim in Melinde (East Africa) and showed him the great wooden

astrolabe with him with which the altitude of the sun was taken, the Moor showed no surprise. He said that the Arab pilots of the Red Sea used the instruments made of brass, triangular in form, and quadrants to take the height of the sun and of the Pole star. He added that “the sailors of Cambay and the whole of India sailed with the help of certain stars, southern as well as northern, and other notable stars which crossed the centre of the heavens from east to west.”⁸¹

Astrolabe “owes its origin to the pre-Islamic period.”⁸² The Christian philosopher Johannes Philoponus wrote a treatise on it in Greek, and the Christian bishop of Kennesrin, Severus Sebokht of Nisibis, also wrote a description in Syriac. The earliest treatise in Arabic on *astrolabe* dates from the ninth century AD and is by Māsha’ āllah, the Messahalla who influenced Chaucer in his treatise: *The Conclusions of the Astrolabic*. The earliest Arab *astrolabes* needed as many plates as the number of latitudes employed. “Ali ibn Khalaf in the tenth century AD invented the universal plate which was the stereographic projection of the sphere on a plane perpendicular to the ecliptic and cutting it according to the solstitial line of Cancer-Capricorn.”^{82a} The ‘universal instrument’ of Jabir ibn Aflah used for astronomy as well as mathematics and physics was the forerunner of the European *torquetum*. Muzaffar Sharaf al-Din al-Tūsī further simplified the instrument by inventing a linear model. There is a beautiful multiplate brass *astrolabe* at the Khuda Bakhsh Library, Patna.

Once Hadley’s quadrant was introduced in 1731, latitudes “could be determined to a very great degree of accuracy.”⁸³ It was further improved by Captain Campbell RN and emerged as a sextant, beautifully constructed by John Bird. Later, Jesse Ramsden produced an instrument

only a fraction of the size of Bird's without losing any of its precision. With improvements in nautical instruments, a sailor can even divine the undercurrents and predict the weather, but has yet to devise means to control them.

Modern instruments have brought about enormous improvement in hydrography and the art of cartography. The charts carry skyline profiles of the coastal landscape as observed from the sea as one can observe in the *West Coast Pilot* or the modern nautical charts.⁸⁴ A single map sketch depicts 25° to 30° of arc of the visible horizon from the observer's position. Minimal locational information is also mentioned on the charts. "The distances are not in units of length current now, but are expressed in *zams*. The *zam* is a unit of time-distance that Indian sailors used during the medieval times."⁸⁵ Eight *zams* made a day's sailing and correspond to Hindu *pahars* divided into *gharis*. The maps and charts not only indicate distances but also directions which are crucial to navigation.

Prof. B. Arunachalam of the Bombay University has given a number of charts to illustrate their utilitarian perspective with limited information base which is of immense use to men on board. He is also compiling a glossary of nautical terms not only giving the equivalents in various Indian languages but also in Arabic. For example, rudder in Marathi is *sukhan* or *avari*; in Kannada *chukkan* or *karna*; in Malayalam *amakkai*, *karnakam*, *atanampu* or *tula*; in Divehi *hungana*; in Tamil also *sukhan*; in Sanskrit *aribia* or *kenipataka*, and in Arabic *alat*.

Steel-and-steam Ships

Once steel-and-steam ships appeared on the seas and nautical instruments were modernised, their wood-

constructed brothers were treated like poor relations. Simultaneously, the importance of watching the waters, waves, currents, sun, moon and stars declined. Compared to the modern multi-storey luxury liners with swimming pools, tennis courts, and deluxe suites, the best ships of yester years may not look better than bath tubs. We have now very large crude carriers (VLCC) of several million tonnes dwt. India makes Panamax type ships of 86,000 dwt or more. Among warships there are leviathan aircraft carriers as also ships equipped with international ballistic missiles (IBMs) which can shoot targets hundred of miles away. The submarines, confirmed the Naval Chief, Admiral V.P. Shekhawat, have not become more comfortable over the past sixteen years when this scribe travelled in one on the Bay of Bengal.

All types of ships have in modern times undergone enormous changes in size, sophistication, construction technologies, comfort, instrumentation and navigation. Now no more a sailor looks at the sun, the moon, the stars and their constellations. Nor does he bother about the feel of the winds, or the behaviour of the waves and currents, or watches the colour of sea water, the fish and sea-snakes. Everything is electronised and computerised. It is literally much more smooth sailing. But in adventure, enterprise, ingenuity, daredevillery and intimate relationship with nature, the sailors of yore were as good, if not superior, than their present-day compatriots.

CHAPTER IX

Indian Shipping After Independence

We set out on a long voyage, as it were, to explore and build the story of Indian shipping and shipbuilding. That story shall not be complete unless we explain the vigour Indian shipping experienced after the attainment of Independence on 15 August 1947. Before we do that, it is better to briefly recapitulate the story told so far.

It is worthwhile to bear in mind that India is almost a continent, with several maritime states bigger than Portugal, the Netherlands, Germany, France, and the United Kingdom. The country has seas on three sides and its total coastline is nearly 7000 km. It has been the home of two most ancient civilizations of the world and has been the nursery of many creative ideas of the human race. Being rich in flora and fauna and a vast variety of natural resources, it has been the cynosure of all eyes and a dreamed destination of many peoples.

The axe of archaeologists has brought to light one of the oldest - if not the oldest - ports of the world at Lothal in Gujarat. By Carbon-14 method it is dated 2200 BC. The marine architecture it reveals - with sluice gates, warehouses and all that - should have easily taken a few hundred years to evolve. The dock was designed large enough to take in at least thirty ships at a time. Indian ships laden with merchandise were going to Persian Gulf, Red Sea and the

east coast of Africa. Ships of other countries berthed at Lothal and other docks. There was a flourishing trade some 5000 years from now. Alan Villiers, the well-known explorer, is sure that Indian Ocean is the birthplace of sailings in the world. Charles Verlinden, Chairman, International Commission for Maritime History, Brussels, confirms there was commerce between Babylon and India more than 3000 years before the birth of Christ.

Some of the Indus Valley seals do bear the line-drawings of boats and ships. A Japanese sailor, a student of Mesopotamian seals, is of opinion that the ships in Sumeria are very similar to those being constructed at Kozhikode in Kerala. Therefore he thinks that the Sumerian ships were built in India and exported to Sumeria. But the seals of Indus Valley have yet to be deciphered. When someone is able to “read” them, may be, fresh light is thrown on the story of Indian shipping.

Literary Evidence

We have mentioned extensive literary and artistic references to establish the popularity of Indian shipping since times immemorial. Stories about navigation, sea voyages and shipwrecks abound in the *Rigveda*, said to be the oldest book of the world. The epics of the *Ramayana* and the *Mahabharata* also refer to voyages by sea. The story of Lord Rama crossing the Gulf of Mannar to reach Lanka is well known. The *Mahabharata* mentions the great ports of Prabhasa, Dwarka, Sabarkachha and Bhrigukachcha, the modern Broach. Here we find the hero Arjuna storming the port of Nivata Kavochoa choked “with thousands of ships carrying enormous wealth. Further beyond, he captured the more prosperous town called Hiranyapura belonging to Paulomas and Kalakeyas.”¹ Bhima sets out from Tāmralipti,

conquers Sagaradvipa, Kolagiri, Mirachipattana (may be Muziris of the *Periplus*) and Samjayanti, (modern Vijaydurg). “The *Panchajana* ship in which Krishna and his friend Uddhava entered stealthily at night sailed from Prabhasa,”² and was bound for an Egyptian port called Vaivasvatpuri. In *Raghuvansha*, Kalidasa, the poet laureate of the Gupta court, mentions the use of *matsya yantra* by the sailors to find directions.

In fact the ‘sea’ is etched deeply in the Hindu psyche. See the symbolism of Lord Vishnu lying on a lotus in an ocean of milk (*kshir sagar*). Look at another scene: the gods and demons make a churner of Meru mountain, use a huge serpent as the rope and churn the ocean to find out *amrit*-nectar - and other unique articles. There is a special god of ocean called Varuna who regulates waters, causes the rivers to flow and resides in the ocean riding on *makara* as his vehicle.

In the seventh-sixth century BC, according to Prof Needham, the Chinese junks and Indian ships were quite common along the coast of East Africa and the island of Madagascar. Whether they rounded South Africa and explored the western coast cannot be said with certainty. Around the same time, an Indian prince of Orissa sailed to Sri Lanka, married a Vedda princess and started the Singhala race. “The early legends of Java mention that twenty thousand families were sent to Java by the king of Kling. These people prospered and multiplied.”³

It is well-established that the Buddhist monks and missionaries sailed to Southeast Asian countries as far as Japan to spread the message of their master. The visits of the son and daughter of Asoka the Great to Ceylon to convert

the king and queen of the island to the peaceful philosophy of Lord Buddha are well attested. The Mauryan kings in fact thoroughly reorganised the shipping industry almost on modern lines having a controller of shipping, chairman of a port, berthing and warehousing facilities, fixed port and other charges, and a shipping register. With such meticulous management, Indian shipping received a great fillip.

Kingdoms in Southeast Asia

In the first century BC/AD, Indian explorers from Gujarat in the west to Bengal in the east, including the ports on the western and eastern coasts, were sailing to distant lands in the Far East. The first Hindu kingdom was set up in Funan - almost corresponding to present day Cambodia - by one legendary Brahmin Kaundinya. Others followed in Khamboja in the north, Malaya and Indonesia in the south, and the islands of Borneo and Celebes in the Far East. Of these kings Srivijaya and Shailendras are widely known. Their strategy was to control important sealanes so that trade and commerce could prosper. They were also great patrons of art and architecture. Learned scholars like R.C. Majumdar, George Coedes, Le May, Masudi and Idrisi have given gushing accounts of their shipping ventures and benign administration. They ruled for more than a thousand years. The clash of the Cholas of the Coromandal coast with these kings to ensure an easy access to trade with China and other countries contributed to their disintegration.

After the Mauryas, the other great power which strengthened unified control and encouraged commercial activities was the Imperial Guptas. Their reign witnessed all round burst of creative activity. In science, Aryabhata (born 476 AD) propounded two important principles: that the earth revolves on its own axis, and it orbits round the sun. This

astronomical breakthrough was a boon to sailors in navigation. He was the first mathematician to streamline the decimal system and the concept of zero. Many other scientists and scholars like Varahmihira followed and wrote many treatises on various topics.

Advent of Muslims

The Muslims attacked India by sea for the first time in the early eighth century. They conquered a part of Sind but all their attempts to penetrate farther east or south were foiled by the Saindhavas who were noted for their naval supremacy. They bore the title of '*aparasamudradhipati*, i.e. 'Masters of the Western Seas.' Says R.C. Majumdar, "The credit of saving India from Arab invasion by sea justly belongs to the Saindhavas who are chiefly remarkable as being one of the few powers in ancient India with a distinguished record of naval exploits."⁴

The Sultanate period was barren as far as shipping is concerned. In early sixteenth century, the Mughals came from a region where no sea could be seen far and wide. Even the rivers were few and far between. Babar therefore must have been fascinated to find so many large rivers in northern India. He had several big boats and gave them interesting names like *Gunjaish* and *Farmaish*. His son Humayun was also fond of rowing on the rivers. Akbar did build an Imperial *nowwara* (fleet) of several thousand boats. Jahangir and Shahjahan fought some riverine battles with various types of boats fitted with guns. Aurangzeb did try to raise a powerful navy as he was much harassed by the Portuguese and the Marathas. He, however, gave up the idea and depended upon the Siddis of Abyssinia to fight his naval battles.

Entry of European Powers

The Portuguese had entered Indian waters with a big bang twenty-eight years before the arrival of Babar. Till then, guns on ships was a rare sight, and fortification of ports was not in vogue. The Portuguese introduced altogether a new element in the Indian Ocean by claiming sovereignty over the seas and monopoly rights over trade in certain commodities. Imagine the humiliation of Indian traders - and even Imperial ships - begging for a permit from the Portuguese to ply their vessels in their own waters. Only the naval fleet of Shivaji could measure swords with the Portuguese who accepted him as their 'equal on sea.'

Once the sea-route round the Cape of Good Hope became known - as the alternative route via the Mediterranean and Red Sea was blocked by the Turks - several other European powers began to fish in the troubled waters. The Dutch uprooted the Portuguese who themselves were replaced by the French and the British. All played the same political game of playing one Indian ruler against another and acquiring more facilities for themselves. Steadily they acquired more land, built more forts, raised larger armies, controlled more trade, and also fought for supremacy among themselves. In this free for all, at a time when India was parcelled out in small principalities and lacked a unified central authority, the British emerged on the top.

A company of British adventurers which came to trade with a fleet, planted the British flag on Indian soil and handed over an Empire to their Crown in 1858. The Indian Empire was much bigger than all the British Empire overseas possessions put together!

Appreciating the importance of a naval force, the English East India Company soon after their arrival, had set

up Indian Marine in 1613 to protect the Company's trade. It was Indian Marine which fought with the Maratha Navy first in 1659 and then in 1664. Nearly a century later with the acquisition of Bombay, came the Bombay Marine. In 1877, the Indian Marine was reorganised and renamed first as Royal Indian Marine (RIM) and then as Her Majesty's Indian Marine in 1892. It was transformed into Royal Indian Navy in 1934, and then the Indian Navy after India was declared a republic in 1950.

A Part of Freedom Struggle

The story of Indian shipping after Independence can be better appreciated if we know the background of the glorious saga of relentless struggle between the British and Indian shipping interests. In the words of Mahatma Gandhi, Indian shipping industry "had to perish so that the British shipping might flourish." In fact the movement for securing a place for Indian shipping under the sun became a part of the freedom struggle.

The United Kingdom was an old hand in promulgating restrictive legislation. It passed the first Navigation Act in 1646, which was tightened in 1650 preventing all foreign ships from trading with American colonies. Cromwell's notorious Navigation Act debarred import of all commodities manufactured in Asia, Africa and America, into England except in British built ships owned by the British.⁵ It was only after two centuries, when steam-and-steel ships roamed the high seas, that these obnoxious measures were first relaxed, and then finally repealed.

The first steam-propelled boat appeared on the *Gomti* in Lucknow in 1819 as a pleasure boat of the Nawab of Oudh. The first steamship *Hugh Lindsay* was built at Bombay

dockyard and within a decade, the first iron ship *Planet* was launched also at Bombay. A regular steam-boat passenger service started operating on the *Hooghly* in 1823. Between 1839 and 1857, nearly a score of iron and steam vessels were built at the Bombay dockyard, including a frigate, the *Firoz*, of 1,450 tons.⁶ In the words of historian Taylor: "The arrival in the Port of London of Indian produce in India-built ships created a sensation among the monopolists, which could have never been exceeded if a hostile fleet had appeared in the *Thames*."⁷ The British shipbuilders were alarmed and raised a hue and cry. This led the British government to enact a law in 1814 debarring Indian sailors to be treated as British mariners, and almost amounted to the declaration of war on Indian shipping.

Sir William Digby was pleased to write in *Prosperous British India* (1901); "The ancient occupations of the people (of India) on sea and land have been destroyed. The ships which now carry India's coastwise trade are steamers built in Britain, the officers are Britons, the profits derivable from the trade go to Britain. We are literally draining India dry - "bleeding" was Lord Salisbury's term in 1875. It is more accurate than my own."⁸ It is difficult to describe the destruction of Indian industry and the then condition of Indian shipping more eloquently.

The monopoly of the British India Steam Navigation Company (BI) and the Peninsular and Oriental Steam Navigation Company (P & O) was firmly entrenched by Lord Inchape. He became chairman of BI in 1913, and that of P & O the following year when the two companies were amalgamated. Most of the 102 Indian navigation companies registered between 1860 and 1925 with a capital of Rs 46 crore had to go into liquidation. The editor of the *Statesman*,

Sir Alfred Watson, had to admit, “Indian company after company which endeavored to develop a coastal service has been financially shattered by the heavy competition of British interests”.⁹ Among them was the Tata Line started by the great compatriot, Jamsetji Nusserwanji Tata, in 1894, and the Swadeshi Shipping Company set up by V.O. Chidambaram Pillai in 1906.

It was the Scindia Steam Navigation Company Limited (SSNCL) founded in 1919 which picked up the gauntlet against the powerful combine of BI and P & O, both ruled by Lord Inchape. Maharaja Madhavrao Scindia of Gwalior had purchased *SS Loyalty* from the Canadian Pacific Line and was keen to sell it. Narottam Morarjee, a textile magnate, and Walchand Hirachand formed a syndicate and bought *SS Loyalty*. On 27 March 1919, SSNCL was registered with an authorised capital of Rs 4.5 crore.¹⁰ On the ninth day, 5 April 1919, *SS Loyalty* sailed from Bombay as an Indian passenger ship bound for the UK, which is the day when national shipping was reborn. Since 1964, appropriately, April 5 is being celebrated annually as India’s National Maritime Day.

At a time when colonial exploitation was in full swing and Indian industries and handicrafts were being systematically decimated, SSNCL emerged as an emblem of the swadeshi spirit. It had full support of the national leaders and Narottam-Walchand duo were in high spirits to measure swords with the British interests. In the words of Dr Rajendra Prasad, the first President of India, they were “prepared to suffer the disappointments and temporary setbacks and failures with the vicissitudes of the national

Note : 1 Crore = 10 million

movement until the day of liberation.”¹¹ They never looked back and went on launching one ship after another.

The Indian leaders took the fight to the legislative chambers. In the first session of the reformed Central Legislative Assembly on 12 January 1922, Sir P.S. Sivaswamy Aiyar moved a resolution to constitute a committee to investigate the ways and means of promoting Indian shipping and shipbuilding and form an Indian Mercantile Marine. It was a comprehensive resolution asking the committee to consider measures like recruitment of Indians in the Royal Indian Marine, setting up a nautical college for imparting training, and construction of dockyards in Indian ports. The resolution was adopted by the Assembly without a division.

The report of the Indian Mercantile Marine Committee submitted in March 1924 recommended: reservation of coastal trade on specific conditions; purchase of a British line operating on the coast and its eventual transfer to approved Indian owners; and conversion of the Royal Indian Marine Troopship *Dufferin* to a training school for deck and engine room staff.¹² The committee left out several important subjects like international trade and liquidation of British shipping monopoly. But the Indian pressure was continued.

On 9 February 1928, S.N. Haji who was elected to the Legislative Assembly in 1926, introduced in the House the “Reservation of the Coastal Traffic” Bill. In the debate on the Bill held in September, each side marshalled its best talent. The Indian side was represented by a galaxy of supporters like Motilal Nehru, Lala Lajpat Rai, R.K. Shanmukham Chetty and G.D. Birla. Referring to Sir James Simpson’s demand for “national” treatment, “Motilal Nehru asked “what is claimed by national treatment?... Is it a thing

which goes floating about on the seas which one has to cross between India and England.... The present combines may form the mercantile marine of India but the tragedy of it will be that it will be a mercantile marine of India with no Indian on it!"¹³

The Lion of Punjab roared: "For those gentlemen over there to accuse us of discriminatory legislation against them is absurd. The whole of their activities, the whole of their trade in this country is based on discrimination."¹⁴ To vindicate the Indian shipping industry, the Lala said: "Indian shipping capitalised by Indian capitalists is absolutely essential if India is to develop her shipping industry ...The shipping industry is a key industry....It is absolutely necessary for the defence of the country; it is absolutely necessary in time to come for our existence as an independent and free nation."¹⁵ The tone and tenor of these speeches illustrate that the Indian leaders as early as in the, 20s' appreciated the importance of shipping industry.

The Bill was referred to a Select Committee of 21 members presided over by Pandit Madan Mohan Malaviya. It was passed by the Assembly by 71 votes to 46 - an unusually large majority for those days. It was not unexpected that the three European members appended Minutes of Dissent. They had not forgotten the views of the Bengal Chamber of Commerce that "to reserve the Indian coastal trade for an Indian mercantile marine, which at the moment is not in existence, would be fatal."¹⁶ The Select Committee was asked to report on the Bill by 10 February 1929. The Coastal Reservation Bill emerged through the Select Committee with its essential provisions unscathed.

Many more decades had to pass before the Indian monopoly of coastal trade was to be extracted from the

British hands. At the end of 1939, when the Tripartite Agreement of 1933 arrived at amongst BI, Asiatic and Scindias was to expire, efforts were being made to secure at least a 50 per cent share in the coastal trade and a substantial entry into overseas commerce. This modest demand was fully justified on merits, and even the Imperial Shipping Committee in its 38th report of 1939 had supported the cause of Indian shipping.

Referring to the need to meet Japanese shipping competition in Indian trade, the Committee noted: "There must be created in a greater degree than exists today, a genuine Indian interest in the mercantile marine of the Commonwealth. We hope that in the face of the well organised Japanese competition, it will be recognised both by the Indian and the U.K. shipowners that a new and larger spirit of cooperation is called for ... There will always be scope under the conditions of oceanic trade, growing with the increasing enterprise of the Orient, both for the Indian and the U.K. mercantile marine in the trade with India ..."¹⁷

At the beginning of World War II in 1939, "as against the world tonnage of nearly 70 million grt, and that of Britain's over 17 million grt, India possessed barely 132,000 grt of shipping with ten shipping companies owning 63 vessels."¹⁸ Of this, Scindias together with their five associate companies, accounted for a lion's share of 120,000 grt owning 23 ships. All this gross registered tonnage was confined to coastal trade in which too "they carried only about 40 per cent of the cargo, the balance of 60 per cent being carried in foreign bottoms."¹⁹ Due to losses during the war, the tonnage was brought down to less than 100,000 grt comprising 42 ships at the end of the war in 1945.

The inadequacy of the fleet was admitted by the Government of India in their memorandum circulated in October 1945 to the members of the Post-War Reconstruction Committee. This committee appointed a subcommittee with Sir C.P. Ramaswamy Aiyar as chairman and Messrs M.A. Master, K.C. Neogy, W.L.A. Radcliffe and Sir A.H. Ghuznavi as members. The recommendations of the subcommittee were published in July 1947 which defined the criteria of a company to qualify as an Indian shipping company. The subcommittee desired that "the entire coastal trade should be reserved for Indian shipping."²⁰ It also recommended in March 1947 that Indian shipping should secure at least 75 per cent share in near and adjacent trades, 50 per cent in the distant trades and 30 per cent in the oriental trade. In that case, a tonnage target of 2 million grt should be reached in seven years.²¹

Coastal Shipping

In pursuance of these recommendations on 15 August 1950, the Government of India announced that coastal reservation should be completed in one year's time, by 15 August 1951. As a sequence, the Indian Coastal Conference was set up in early 1951 but the actual reservation was completed in the third quarter of 1952. At the end of this period, no foreign ship was operating in the coastal trade of India. It was however another matter that when three foreign oil companies - Burmah Shell, Esso and Caltex - were allowed to set up oil refineries in India, they were permitted to bring crude in foreign tankers - as India had no tanker at that time - which operated on coasts to carry refined products. By and large, within five years of India's Independence, Indian coastal shipping was mostly run by the Indians.

By the end of the Third Five Year Plan, the coastal shipping tonnage had reached a respectable 0.340 million grt comprising 92 vessels. But in the next two decades, by 1984-85, the tonnage had inched up only to 0.345 million grt with an addition of seven more ships. Coastal vessels cannot be acquired from foreign yards as they do not normally earn foreign exchange and have to be constructed locally.²² It is only in 1989-90 that coastal shipping could boast of 159 vessels aggregating 0.518 million grt.

Over the years the coastal fleet has been suitably diversified. Almost half of the total comprises the offshore supply vessels which mainly cater to the needs of Oil & Natural Gas Corporation (ONGC). As on 31 March 1994, 204 vessels of 0.644 million grt were engaged in coastal trade of which 100 were serving the offshore installations, 42 were dry cargo vessels, 23 dry cargo bulk carriers, 13 tankers, 12 passenger-cum-cargo, 10 tugs, 3 ethylene gas carriers and 1 timber carrier.²³ The main commodities carried by coastal ships include crude and POL products, coal, cement, iron ore, fertiliser and salt.

Coastal shipping is ideally suited to carry long distance bulk cargo and passenger traffic, specially for destinations on the water-front. Decades ago the Transport Enquiry Committee had observed that water transport is the most energy efficient and comparatively cheaper mode of transport. But not much attention has been paid to devise an intermodal transport mix for the most efficient utilisation of national resources for transporting various commodities.

Coastal shipping has a lot of scope for further development provided some constraints are removed and adequate facilities provided. Customs procedure is one of the

biggest bottlenecks requiring enormous documentation and avoidable delays. Port facilities have to be streamlined, particularly at Port Blair. Freight rates have to be rationalised. Government subsidy on movement of goods between the mainland and outlying island groups cannot be a permanent solution. It is a service and may not earn much profit but the traffic should pay the cost incurred. There is a tendency among trained navigators to look for greener pastures abroad. The pay and perk structure should be so modified so as to discourage flight of talent and retain the qualified personnel.

The possibilities of introducing roll-on roll-off and other fast moving ferry vessels need to be explored. Wherever possible, coordination should be established between coastal shipping and inland water transport. Similarly, rail and road transport should be utilised for quick clearance of goods at ports or else unhealthy competition may harm both.

Indian Shipping After Independence

On the eve of Independence in August 1947, the total Indian shipping tonnage stood at 192,000 grt comprising 48 coastal ships of 0.119 million grt and 11 overseas vessels of 73,000 grt. In the background of the freedom struggle, the government of independent India was keen to undertake a comprehensive development of Indian shipping. In a message to the inaugural function of the Scindia House at Bombay on 23 December 1938, Pandit Jawaharlal Nehru had said : “For many years past I have watched with interest the struggle of national shipping interests against powerful shipping companies aided by the British Government. I had no doubt that if India had been a free country and in a position to control her own destiny, we would have developed long ago a national mercantile marine worthy of our

country, whose ships would have ploughed the oceans of the world and been welcome visitors to its great ports... I am impatient to see Indian ships carrying the flag of India across distant seas to far away countries.”²⁴ Now the country was free and he as the first Prime Minister was at the helm of affairs.

Pt. Nehru's policy of 'mixed economy' involved both, public and private sectors to achieve quick results in the development of Indian shipping. Since the private sector was already there, it was the government which had to play a prominent role. The development of Indian shipping comprises four main components : increasing shipping tonnage to earn/save foreign exchange; providing facilities at ports commensurate with the changing pattern of trade; augmenting shipbuilding and ship repairs on the most modern lines; and training the required crew to man a variety of vessels.

First, a few preliminaries. Shipping is a service industry. It serves trade and commercial interests of a country. Therefore the composition of its fleet depends upon the type of merchandise imported and exported. For example, if India has to import enormous quantities of crude, its fleet must include a good number of very large crude carriers (VLCCs). For exporting iron ore to Japan, the most suitable port might be Visakhapatnam and dry bulk carriers shall have to be obtained. Specialised carriers may have to be acquired if the country undertakes exports of marine products, or highly inflammable articles like LPG and ammonia.

Generally speaking, exporting/importing in one's own bottoms should be of great help in earning/saving precious foreign exchange. Not unoften, when merchandise is carried in foreign vessels, the ship owners also insist on having

insurance etc. from the companies of their countries. As such, not only we lose foreign exchange earnings but have also to pay several other charges to foreign companies. But sometimes if a half-loaded ship of a foreign company is on way to India, it might be more economical to utilise its spare capacity than to carry small cargo in one's own ship.

Thirdly, the concomitant facilities at Indian ports have to be in line with the commodities they are likely to import/export. Sometimes the cost of providing specific berthing capability could be shared by prime industry on some mutually arrived at arrangement. Visakhapatnam port has installed a 9 km overhead conveyor belt to carry iron ore from shore to ship. Some ore-bulk-oil carrier berths have been partially financed by the concerned industries. It benefits both - the port as well as the industry.

Fourthly, the shipping of one country is connected, howsoever intangibly, with the world shipping. The freight and port charges have therefore to be competitive and in keeping with international practices. Like any other industry, shipping also has to be constantly on look out to offer better terms and conditions to attract business. There is no excuse, for example, for keeping some ships in mid-ocean for weeks on end for want of adequate berthing facilities at the port. The loading/unloading charges have to be streamlined and customs hassles cut down to minimum. There should be adequate arrangements at each port for proper storage of goods, and their speedy clearance.

Briefly, shipping is a highly competitive industry. Those who run it should have the vision of a statesman to anticipate and provide for events at least ten years hence. They should possess a rare combination of international 'intelligence',

resilience, financial discipline and the capacity to take quick decisions. Needless to say, they should know about the developments at ports, economical ocean routes and pattern of trade in other parts of the world, particularly the neighbouring countries. It may be the first impulse to raise freight to earn more. But that will raise the price of imports/exports and have far reaching impact on trade. What is required is a fine-tuned balancing act which will finally lead to higher profit on a consistent basis. The days of enforcing monopoly in the trade of certain commodities or controlling some searoutes for exclusive use by a particular power are gone. Transparency and competition are now the buzz words.

Shipping Tonnage

In the light of the stepmotherly, at times hostile treatment, Indian shipping had at the hands of the British, to pull out the industry from the mire and put it on a respectable pedestal but it was a colossal task. We have already referred to the recommendations of the Reconstruction Policy Subcommittee on Shipping 1945. By the Finance Act of 1955, a development rebate of 25 per cent of the cost of a ship was allowed in addition to depreciation allowance for income tax purposes. Later the rebate was increased to 40 per cent. By the end of the First Five Year Plan in 1956, the tonnage at 372,000 grt had almost doubled from a mere 192,000 grt in April 1951. The progress was maintained during the Second Plan. In the Third Plan period, the target of tonnage fixed by the National Shipping Board was even exceeded.²⁵

This was possible with the help of certain measures taken by the Government. In 1958, the Shipping Development Fund Committee (SDFC) was set up. It gave finances at nominal interest to the buyers of ships upto 75 per cent

of the cost of ship with three years moratorium i.e., the shippers only started paying instalments after they began earning from the shipping. This served as a boon to the industry and gave it a big boost. Two years later in 1960, TRANSCART, a chartering organisation of the Government was set up which gave preference to Indian flag vessels to carry Government controlled cargo. In 1961, the Shipping Corporation of India was formed as recommended in the 38th Report of the Estimates Committee of the Lok Sabha. It was a major event and the SCI today is one of the largest shipping companies of the world.

In the early '70s when this scribe was in the ministry, the then minister and secretary of what was called the Ministry of Transport & Shipping, were very keen to raise the tonnage to 10 million grt. But the decade of '80s turned out to be very difficult for the shipping industry the world over. As they used to say at that time, too many ships were chasing too little cargo leading to lowering of freight and cutting into the profits of the companies. Indian shipping just managed to keep its head above water. It suffered from the additional disadvantage of plying over-aged and fuel inefficient ships.

Addition to Indian shipping tonnage had not been uniformly good. It touched the peak of 6.36 million grt in 1984-85, fell to 6.28 million grt in the calendar year 1992 and stood at 6.27 million grt as on 31 July 1994 comprising 448 vessels of various types. The share of Indian shipping in the overseas trade was a mere 9 per cent in 1960-61 which in 32 years rose to 35 per cent in 1992-93.²⁶ Even today the modest objective of carrying at least 50 per cent of trade in Indian bottoms is a distant dream.

According to a study conducted by the Asian Institute of Transport Development, during the period 1984-85 to 1992-93, the share of Indian ships in overseas trade "has fluctuated between 34 and 38 per cent, except in 1987-88 when it reached a peak of 40.7 percent."²⁷ An analysis of the trade pattern reveals that "imports provide a larger share of cargo as compared to exports - around 50 per cent of imports and 16 per cent of exports are carried in Indian ships."²⁸ It is a matter for further investigation, why the share of export cargo has never exceeded 25 per cent.

The study points out that even this share in Indian shipping has been boosted on two counts : "nearly 50 per cent share in the carriage of crude oil and petroleum products and relatively high share - 24 per cent - in the carriage of dry bulk imports."²⁹ This high share is thus due to the canalising of oil imports and government-controlled cargo like fertilisers on government account when preference is guaranteed to Indian flag vessels. Now the present trend is toward decanalisation, and already crude oil import, specially the ATF, has been partially decanalised. When more and more items are decanalised, the advantage of having assured cargo for Indian flag ships will diminish. Indian shipping industry, therefore, has to rise to the occasion and prepare itself to face a situation when there may be severe competition among the shipping lines.

On account of rather poor share of Indian shipping in the overseas trade, the country is suffering from heavy outgo of foreign exchange. In 1991-92, the total freight bill on seaborne trade was estimated at about Rs 62,650 million. Of this, Indian flag ships earned or saved only Rs 18,690 million, or a mere 29.8 per cent. The net foreign exchange after defraying all expenses incurred abroad was Rs 14,130

million which in 1992-93 is estimated to have increased to Rs 18,560 million.³⁰ There is, therefore, a lot of scope for earning/saving more foreign exchange through better planning of the industry.

Shipping Corporation of India

In this rather depressing picture of the industry, the Shipping Corporation of India, a public sector enterprise, emerges on the horizon as a shining star. Since SCI accounts for almost half of the total shipping tonnage, having 2.98 million grt or 47.3 per cent in operation, and another 0.42 million grt on order, it deserves a detailed discussion. In other words, after the decline of the Scindia Steam Navigation Company, which did pioneering work for the industry, all the private shipping companies taken together have been able to muster only 52.7 per cent of the total tonnage. The largest nine private sector companies among themselves own 2.12 million grt and many among the remaining 54 companies own only one or two ships.³¹ Some of the private companies have done well in certain areas but on the whole their performance has not been worth writing home about.

The credit for the success of the Shipping Corporation goes to its enlightened management who have anticipated events, adjusted their sails to the changing winds, taken timely action to diversify their fleet, gone to the basics of even providing appropriate training, and thereby made a significant contribution to national development. Visualising the precarious oil position, and simultaneously with the discovery of oil in the Bombay High around 1976, for example, SCI collaborated with the Oil & Natural Gas Corporation Ltd. (ONGC) and gainfully pressed into service their tankers and combination carriers. Since Bombay High oil was of superior quality which could be exported to earn

foreign exchange, SCI provided floating storage facilities for the Bombay High crude oil. It also evolved a system of reverse lighterage under which oil from the wells is transferred into tankers and stored till its final shipment. This made good use of SCI tankers and VLCCs and also provided a total package of service to the oil industry.

No oil-rig or production platform can function unless off-shore supply vessels (OSVs) are there to transport enormous quantities of material to and fro the platform. SCI faced all the risks of operating under very inclement weather conditions to serve the off-shore installations. Often the crew had to undertake rescue and fire fighting operations for which special tough training was imparted to them. Two of the company's anchor handling-cum-tug vessels won Maritime Gallantry Awards for rescue work during 1993-94.³²

The SCI is perhaps the only shipping company in the world which has provided modern training facilities for its employees. It has set up a Maritime Training Institute at Powai near Bombay. It has the distinction of being recognised as a branch of the World Maritime University of Malmo (Sweden) for conducting specialised courses in India for the countries of Asia and the Pacific region. A high level Committee on Maritime Education & Training (COMET) set up under Dr. C.P. Srivastava (now Sir C.P.) suggested in November 1992 to increase training facilities. As a follow-up, a Merchant Marine Education & Research Trust (MMERT) was formed and funds for training of navigating and engineering officers were collected on a notional manning @ \$ 10 per officer and \$ 5 per month on crew per ship manned by Indian officers and crew. This will to some extent meet the shortage of navigating officers.

Diversified Fleet

Over the years, the Corporation has raised a highly diversified fleet of 124 vessels and has grown 26 times in the past 32 years. Beginning with only 19 ships in 1961, the company's fleet now includes liner ships, bulk carriers, ore-bulk-oil carriers, crude oil tankers, very large crude carriers (VLCCs), product and combination carriers, passenger-cum-cargo ships and container oriented ships. As the necessity arose, it has also acquired a number of specialised vessels to transport items like LPG and ammonia. SCI has resumed its container service on the India/UK-Continent sector in January 1994 with the three newly acquired cellular container ships of 1869 TEU each.³³ The SCI is the only shipping company in India owning and operating fully cellular container vessels. This is a highly competitive service monopolised by foreign lines but SCI enjoys the rough and tumble of international competition. Starting primarily as a liner shipping company, the Corporation has now emerged as one of the largest and highly diversified ship-owning companies in the world.

The SCI operates in practically all areas of shipping business nationally as well as covering the four continents of the world. The sectors operated include India/USA, India/UK, India/Japan, India/Black Sea/Mediterranean and India/East Africa. It is significant to note that over 95 per cent of Indian crude oil imports are lifted by SCI tankers. Similarly, it has an appreciable presence in dry bulk trade like export of iron ore, import of coking coal, fertilisers etc. Nationally, SCI operates domestic passenger-cum-cargo service between the mainland and the Andaman and Lakshdweep group of islands.

The Corporation has drawn up an acquisition programme of 79 vessels aggregating 2.8 million dwt during the Eighth

Plan period. This would entail an investment of about Rs 50,000 million of which the Planning Commission has approved only Rs 33,000 million. Of these, the company has already acquired 4 vessels (2 each bulk carriers and general cargo vessels). Four crude tankers of 140,000 dwt size are on order.³⁴

The country envisages to acquire ships of total capacity of 2.5 million grt during the Eighth Plan period requiring a capital outlay of about Rs 250,000 million. In the first two years of the Plan, 1.25 million grt was added and 0.95 million grt deleted. How much addition is actually made to the overall tonnage depends upon the funds made available to the industry.

Brief Background

The first public sector shipping corporation was established in 1950 under an agreement with Scindia's as Eastern Shipping Corporation Ltd. A Western Corporation was set up in 1956. The two were amalgamated and Shipping Corporation of India was formed on 2 October 1961 with an authorised capital of Rs 350 million and paid-up capital of Rs 234.5 million. The Jayanti Shipping Company became a subsidiary of SCI on 17 October 1971 when it took over 16 ships and loss of about Rs 48 million of the company.

The Mogul Line, which began as the Bombay Persia Steam Navigation Company in 1877 to carry pilgrims to Mecca and came to be known as Mogul Line in 1913, was merged with SCI on 30 June 1986 taking over its fleet of 12 ships aggregating 0.15 million grt. It also mans and manages 29 vessels on behalf of various government departments and public sector enterprises. Today, the Shipping Corporation has an authorised capital of Rs 3500 million and

paid-up capital of Rs 2823 million. During 1993-94, the company earned a net profit of Rs 167.6 million which is the highest made by the Corporation so far.

Development of Ports

Addition to shipping tonnage depends mainly upon the availability of funds. Port development on the other hand is a highly complicated affair. The facilities to be provided at each port have to meet the requirements of imports and exports, their quantities and contents, and the size and type of ships seeking berths. The ancient Indian ports were well-equipped to hold, harbour and handle wooden ships of those days. About five thousand years ago, India had flourishing trade with the neighbouring countries. The western and eastern coasts were dotted with a chain of ports. Some of them have silted and gone out of use; others have changed their locations and names. In fact, the same port at times was called by various names by the shippers of different nationalities. For example, the present day Broach was Barygaza for the Greeks and Bharu Kachha - a corruption of Sanskrit Bhrigukaccha - for the Indians. A number of new ports have come up since at fresh sites.

The ancient harbours were like a beehive of a vast variety of ships from different nationalities. The wooden ships had their own charm. With well rigged masts, a lookout shouting from the top, bulging bellowing sails, designs and decorations, colours and 'costumes', they sailed like swans on the bosom of blue waters. Their size was small and they did not carry very large cargo.

The tonnage even in later years generally varied between 500 and 1000 tons; most of the vessels were far below that tonnage, and only a few exceeded it. The harbour was

a haven for them and the facilities were commensurate with the cargo they carried. These ships were likened by some poets to beautifully decorated elephants who danced on waves and rubbed against the wooden beams to which they were tied. Merchants and sailors wearing different dresses and speaking in strange tongues jostled together in the marts. It must indeed have been a sight to see. What remains now of those scenes but sweet dreams; memory whips them but they will not come to life!

This peaceful scene at Indian ports underwent a sea-change with the arrival of the Portuguese in closing years of the fifteenth century. They started turning ports into forts and changing free friendly-trade into a restricted monopolistic right. Indians responded by building their own forts. The Marathas took a page from the Portuguese book and began building forts. Some of the forts were captured by Shivaji from the Portuguese and quite a few adapted their engineering and defence strategy. This was perhaps the first major development in changing the erstwhile concept of Indian ports.

Another important development which changed the face of Indian ports - or of ports the world over - was the emergence of steam-and-steel ships. Once the basic principles were understood, bigger and better vessels were built. Around the same time, about mid-eighteenth century, the extensive use of machines, advancement of science, and growth of technology led to mass production of manufactured items to meet the increasing demands of an expanding population. This indirectly helped to usher in the era of modern port development.

India had her own share of industrial revolution. The first cotton mill was started in Bombay in 1851; the first jute

mill in Calcutta in 1854. The first railway train chugged its way from Bombay to Thana in 1853 which was extended to Kassarah in 1861, to Nagpur in 1867 and to Jabalpore in 1870. The telegraph system was set up in 1858 and in two years port facilities of Bombay, Calcutta and Madras were all linked with Morse. In 1864 cables were laid between India and Europe via Turkey and, after the Suez canal was opened in 1869, via Aden and Suez in 1870. The factory based industrialisation, closer connections with hinterland at home and the world beyond, and impact of international industrial revolution, all accelerated shipping traffic and called for fresh facilities at the ports.

There was therefore a hectic period of port development in the country commencing around 1870. Modern docks and berths were built at the then leading ports of Bombay, Calcutta and Madras. At Bombay, a natural deepwater harbour, the first dock called the Sassoon Dock, was constructed in 1875 which became outdated very soon. The three larger ones came up one after the other—the Prince's Dock with 10 berths and 22 feet draught in 1880, the Victoria Dock with 13 berths and 24 feet water in 1888, and the Alexandra Dock with 20 berths and 30 feet water in 1914.³⁵

Calcutta, which is the only riverine port situated 232 km away from the sea on the left bank of Hooghly, began with four screw-pile jetties in 1870. It put up an oil wharf at Budge Budge in 1886 and the Kidderpore Dock in 1893. The King George's Dock was opened much later in 1922 and renamed Netaji Subhas Dock in 1973. Meanwhile, four riverside jetties and a coal jetty were completed at Garden Reach in 1925. In Madras, which celebrated its official centenary in 1981, the major modern developments took place in the

beginning of the twentieth century when its artificial arms enclosing a basin were constructed during 1910-16.

At Cochin, with a history of several centuries behind when the Raja of Cochin befriended the Portuguese against the Zamorin of Calicut, the development of modern port facilities were first put forth in 1870. The harbour was opened for ocean-going vessels around 1930, the first two shore berths and other facilities like road and rail links were provided in 1940. Two additional berths were constructed a little before 1950. At Karachi, the construction of breakwaters was completed in 1874. At Marmugao, the breakwaters and berths, as also its railway lines, were completed in 1888. The West of India Portuguese Guaranteed Railway Co., responsible for building the port and its connected railway, owed its origin to the Treaty of Lisbon signed in 1878 between the British and the Portuguese governments.³⁶ The port of Visakhapatnam was developed to provide port facilities along the long stretch of coastline between the ports of Calcutta and Madras. Its development started in 1925 and the port with a good harbour and ancillary modern shore facilities was opened for traffic in 1933.*

Major and other Ports

At Independence in 1947, India had only five major ports at Calcutta, Bombay, Madras, Cochin and Visakhapatnam. The Plan years commencing from 1951 witnessed another vigorous period of port development comparable to the early phase after 1870. At present, the

For detailed history of Indian ports, please see author's book on *Ports of India*, Publications Division, 1986.

6000 km of the mainland coastline is serviced by 11 major ports and 139 operable intermediate and minor ports. Of the 11 major ports six, namely Kandla, Bombay, Jawaharlal Nehru (Nhava Sheva), Marmugao, New Mangalore and Cochin fall on the west coast, and the remaining five - Calcutta/Haldia, Paradip, Visakhapatnam, Madras and Tuticorin on the east. The total output of all the ports over this period has grown significantly, from a mere 20 million tonnes (mt) in 1951 to 190 mt in 1993-94. About 95 per cent of the total cargo is handled at the major ports.

A major port is the one which is administered, maintained and developed by the Central Government through the instrument of the Major Port Trusts Act, 1963. The members of the port trust as well as its chairman are appointed by the Centre. A port is declared as 'major' under Section 3(8) of the Indian Ports Act 1908. The Article does not lay down the criteria which will entitle a port to be regarded as 'major' except that the port should be so declared by the Union Government. According to the Ports (Technical) Committee of India (1948), however, the facilities at a major port should include an all-weather sheltered harbour, modern berths which can take alongside steamers with at least 9.14 metre draft, as also direct road and rail links with the hinterland.

The intermediate and minor ports fall under the Concurrent List, that is List III in the Seventh Schedule of the Indian Constitution, and are administratively under the control of the State governments, the Centre providing only technical assistance.³⁷ Technical advice on all matters related to port development, as well as Andaman and Lakshdweep Harbour Works and dredging, is rendered by the Development Wing headed by the Development Adviser (Ports).

Port Development During Plans

With the loss of Karachi after partition, the need was felt to provide a deep-draft port as an alternative. Kandla in Gujarat was chosen as the site in 1948. Work on Kandla started soon after in 1949. It was declared as a major port in 1965 and became the first port to be built after Independence. It serves as a gateway of international trade for the entire hinterland comprising Gujarat, Jammu & Kashmir, Rajasthan, and Punjab. Surprisingly, even the state of Assam prefers to use Kandla for export of tea and jute as their transport over railways is quite competitive compared to export through Calcutta.

Marmugao developed by the Portuguese centuries before, was declared a major port in 1963 after its liberation in 1961 although the Major Port Trusts Act was made applicable on 1 July 1964 when the Board of Trustees was constituted. Paradip in the east came up in 1966 followed by Tuticorin in July 1974, New Mangalore in January 1975 and Haldia in 1977.

The eleventh port across Bombay at Nhava Sheva facing the Elephanta Caves was mainly conceived to share containerised cargo arriving at Bombay. Originally estimated to cost Rs.5810 million, it was completed in 1982 at a total expenditure of Rs.9860 million and started operation in May 1989. It is the most modern port of India built according to international standards and capable of handling containers, third generation cellular gearless vessels and specialised ships like car carriers and ODC vessels with an annual installed capacity of 180,000 TEUs (Twenty-foot equivalent unit of 10 tons). In India the first container ship was received at Cochin in 1973. Soon the facility was extended to other ports like Bombay, Madras, Haldia, and

Tuticorin. The container traffic increased from 9,745 TEUs in 1975-76 to 17,940 TEUs in 1979-80.

Port development is a continuing process undertaken to serve the country's strategic needs as well as trade. The pattern of trade visualised at each port decides the facilities to be created. In the modern environment of economic interdependence, trade of one country is affected by the world trade situation. If the trade prospers, the ports flourish, and with recession in agricultural and industrial production, trade declines and the ports are also faced with problems. Of late, with the growing traffic in POL and the introduction of container and cellular vessels, the ports have to create costly commensurate facilities. We mention here some of the highlights of developments at major ports achieved during various Plans.

In the First Five Year Plan, only Rs 263.2 million were spent on the development of ports. The largest work done was to put up marine oil terminal at Bombay with three oil jetties commissioned in 1956 to feed the first oil refinery of free India at Bombay. The broad objectives of the Second Plan were to modernise and equip the docks and increase berthing capacities at Madras, Cochin and Visakhapatnam. But only about 50 per cent of the total allocation of Rs.980.5 million could be spent, mainly due to dislocation caused by foreign exchange difficulties.

During the Third Plan, provision was made for the modernisation and expansion for the Bombay dock, construction of Haldia dock at Calcutta and development of Mangalore and Tuticorin into all-weather ports. Development of Paradip, started by the Orissa state government, was eventually taken over by the Centre and Paradip was declared as the eighth major port. It was meant mainly to

provide export outlet to the vast ore reserves of the Tumka district.

During the three-year interval between the Third and Fourth Plans, work on Madras Outer Harbour was started, Ballard Pier at Bombay was expanded, an open berth constructed at Cochin, iron ore handling facilities at Visakhapatnam were improved and a fertiliser berth completed.

The Fourth Plan gave a big push to port development. The expenditure of about Rs.2890 million incurred during the Plan was more than the total amount spent during the previous three plans and three annual plans taken together. The programme included completion of the New Mangalore and Tuticorin harbour projects, and that of Haldia to supplement facilities at Calcutta, construction of the outer harbours at Madras and Visakhapatnam, commissioning of the fifth berth at Kandla, development of iron ore handling facilities at Marmugao, provision of an oil berth at Cochin and improvement of the ore handling plant as well as construction of a general cargo berth at Paradip. It was during the Fourth Plan that a central dredging corporation was set up and two dredgers alongwith ancillary equipment acquired.

The Fifth Plan saw the fruition of many projects underway for several years. Tuticorin was declared a major port in July 1974 and New Mangalore in January 1975.* The most important of other developments was the commission-

* It may be mentioned that although works on ports had been in progress for several years and they also handled vessels, but the date of their commissioning has been counted from the time when the Major Port Trusts Act was applied to each and a Board of Trustees was set up.

ing of the outer harbours at Madras and Visakhapatnam. Marmugao acquired a mechanical ore handling plant and Haldia dock system was put into operation for coal and iron ore traffic in March 1977. At Cochin, the first phase of a programme for providing handling facilities for container traffic was completed and container ships started calling at the port.

Important schemes completed during the Sixth Plan included a POL berth at Cochin; container terminal at Madras; general cargo berths at Madras, Tuticorin and New Mangalore; iron ore handling facilities at New Mangalore and Paradip; coal jetty at Tuticorin; the general cargo berth and a new oil jetty at Kandla; a multi-purpose general cargo berth at Marmugao; second and third general cargo berths at Paradip; general-cum-bulk cargo berth at Visakhapatnam and a fertiliser berth at Cochin.

The major schemes that were handled during the Seventh Plan were deepening of Bharathi dock at Madras, additional POL facilities at Madras and Visakhapatnam and a fertiliser berth at Paradip with mechanical unloading facilities. Container handling facilities at Calcutta, Madras and Cochin were strengthened and additional cargo berths set up at Haldia, Paradip, Tuticorin, New Mangalore and Kandla. Details of planwise allocation and actual expenditure may be seen in Table I.

Table I

(Rs in Million)

Plan	Allocation	Actual Expenditure	% of (3) to (2)
(1)	(2)	(3)	(4)
1st Five year plan (1951-56)	642.7	263.2	41.00
2nd Five Year Plan (1956-61)	980.5	455.0	46.40
3rd Five Year Plan (1961-66)	1103.0	929.5	84.30
Annual Plan(1966-67)	373.8	236.6	63.30
Annual Plan(1967-68)	434.8	254.9	58.60
Annual Plan(1968-69)	427.2	396.7	92.80
4th Five Year Plan (1969-74)	3038.8	2890.9	95.06
5th Five Year Plan (1974-79)	5336.0	4143.5	77.65
Annual Plan(1978-79)	929.9	586.0	63.02
Annual Plan(1979-80)	810.0	423.8	62.50
6th Five Year Plan (1980-85)	5210.0	5440.0	104.40
7th Five Year Plan (1985-90)	18990.0	13,410.0	71.0
8th Five Year Plan (1992-97)	32160.0		

Outstanding Achievements

Apart from the excellence of the Jawaharlal Nehru Port (Nhava Sheva), the outer harbour at Visakhapatnam deserves a special mention. The Visakhapatnam man-made outer harbour has a 200-hectare tranquil basin (Madras outer harbour basin is about 81 hectares) which is 16.5 metres deep. The basin area - built through three breakwaters piled up in the turbulent Bay of Bengal on south (1,543 metres), east (1070 metres) and north (412 metres) - is so large as to accommodate 40 pyramids of Giza or 10 Taj Mahal complexes put together. Inside the basin is constructed a 263-metre long ore berth. The berth stands on eight 23-metre high concrete 'cribs', each weighing 15,000 tons, or equivalent to an average naval ship. These were constructed on land upto a height of five metres, towed to the site and launched into water. The construction of remaining 18 metres (76 feet) - the height of a six-storey building - was completed in a record time of one week. The position of cribs at correct locations under floating conditions required high precision and laser beams were used to ensure accuracy. The cribs were then sunk to the correct depth by filling them with water. The cribs are interconnected with pre-stressed RCC beams upon which stand the ore berth - a modest testimony to the competence of Indian engineers.

Another significant feature of the port is the 9-km long all-sides covered conveyor belt spanning a portion of the city carrying ore from shore to ship. The ore is brought from Bailadila and Kiriburu mines by train and stacked at the port. At the stackyard, the ore-laden wagons are lifted by steel clasps like toys and tipped into the hopper carrying ore to the conveyor belt. The conveyor belt runs into a huge mechanical monster of a shiploader moving on rails which can negotiate a 210 degree turn. It can dig deep into the hatch

of a ship and directly discharge ore at a rate of about 8000 tonnes per hour or 133 tonnes per minute. This way of loading at Visakhapatnam port makes it quite competitive compared to other ore-exporting countries like Brazil and Australia.

Madras is another port which is an excellent example of perspective planning. In some other ports, development was dictated by the exigencies of the situation; a demand was first created, steps taken later to meet it, generally suffering from a time lag. Madras, thanks to its enlightened management, has generally been one step ahead of requirements. It lies in the open sea, subject to the fury of cyclones, coupled with the seriousness of silting. The basin has been built by raising stone walls right into the Bay of Bengal. The bane of silting has been turned into a blessing by reclaiming long land stretches for building purposes. An imaginative chairman has constructed a tower with a room on top displaying maps, graphs and charts with lighted layouts where various phases of development could be identified by pressing appropriate buttons. From that vantage point, the Bharathi and Jawahar docks, the breakwaters and the entire port complex with heavy cranes and other equipment lie easy on the eye in proper perspective.

Port development is not confined to putting up berths and providing loading/unloading facilities. It involves many more concomitant requirements like lighthouses, constant dredging, fixing of customs and port charges and maintenance of a shipping register. A port is almost like a small town abounding in a vast variety of machines, sophisticated equipment, warehouses, rail-road links, to mention only a few.

All this requires money. The Central Government provides budgetary support, including external aid to ports. But

the ports largely meet development expenditure from their own internal resources including inter-corporate loans. The Eighth Plan outlay of Rs 32,160 million for ports section includes Rs 12,980 million as budgetary support from government and Rs 19,180 million to be generated from the ports' own income. During the current Plan, some of the developmental schemes are proposed to be implemented with the help from international funding agencies like ADB. During 1992-93, all the major ports had generated surpluses. The financial position of the ports of Calcutta, J.L. Nehru, Cochin and Paradip was rather weak. A statement showing the financial position of major ports for the years 1991-92 to 1993-94 may be seen in Table II.

Table II

Financial Position of Major Ports*

S.No. Name of Port	Operating (1991-92)	Surplus (1992-93)	(Rs in million) (1993-94)
1. Bombay	618.0	1453.5	1767.5
2. Calcutta	546.1	700.4	1297.7
3. Visakhapatnam	369.3	577.5	705.0
4. Cochin	161.6	59.5	74.1
5. Marmugao	99.6	176.4	279.1
6. Paradip	295.6	238.8	482.6 **
7. Tuticorin	102.6	160.9	114.6
8. New Mangalore	94.5	105.0	103.2
9. Jawaharlal Nehru(-)	186.8	234.0	245.9
10. Madras	700.4	890.9	1094.0
11. Kandla	316.6	433.9	500.7

*Provisional

**Source: The Ministry of Surface Transport

Traffic at major ports has increased by almost 6 per cent per year during 1990s. Dry and liquid bulk make up 81 per cent of the port traffic in volume while more valuable general cargo, including containerised, comprised 19 per cent of the tonnage. Traffic handled at major ports from 1991-92 to 1993-94 is mentioned at Table III. Among the commodities handled, POL accounts for the largest portion followed by iron ore, general cargo, coal, fertilisers and containers.

Table III
Traffic Handled at Major Ports*

(in million tonnes)			
Ports	1991-92	1992-93	1993-94
Calcutta/Haldia	17.95	18.32	18.50
Bombay	28.32	29.08	30.74
Madras	23.35	25.33	26.54
Cochin	7.48	7.96	7.62
Visakhapatnam	19.28	22.77	25.59
Kandla	20.30	22.91	24.50
Marmugao	14.64	16.33	18.72
Paradip	7.02	7.60	8.33
New Mangalore	8.51	7.09	8.63
Tuticorin	5.47	6.21	6.70
Jawaharlal Nehru	2.68	3.01	3.39
Total	155.00	166.61	179.26

*Source: Ministry of Surface Transport

Marine Training

Planning of shipping tonnage and development of ports depends mostly on the availability of finances. Once these prerequisites are provided, the most important problem is to

take out ships for sailings on the high seas. It is easy to walk or drive on *terra firma*. Flying a modern aeroplane requires prolonged training supplemented with mock flying in simulated situations to develop split second decision-making capabilities. But the pilot has to contend with mainly the element of wind.

In navigation, the sailor has to take care of two elements - the wind and water, both together presenting a daunting combination. Even a modern large ship is like a dot on the mighty oceans covering three-fourths of the earth. At times the fury of wind could spin a ship like a top. There are strong currents and unseen undercurrents in the ocean which treat a ship like a toy. High waves, whirlpools, coupled with cyclones present an elemental drama. Nearer the shore - and even beyond - there are bars and bends, reefs and rocks. Navigation is a daredevil game demanding great courage and an adventurous spirit. The sailors therefore should have extensive training and long experience to venture over high seas.

Indian sailors have been known for their navigating skills from times immemorial. They have been among the pioneers in the art of sailing for about 5000 years from now. At that vintage, there were only a few gadgets and no modern sophisticated instruments. But the ancient mariners had perhaps sharper senses and greater understanding of the moods of nature. They could "read" the stars, feel the wind, and divine the depth of ocean by the colour of water. By watching marine life, they could guess the distance from land, sometimes even the coast of the country they were approaching. There were no nautical academies and the training they acquired was by trial and error method in the school of experience. No doubt there were occasional

mishaps but with courage and confidence they regularly sailed to the Persian Gulf and east coast of Africa in the West, and went as far as Indonesia, Cambodia, Annam and distant islands of Borneo and Celebes in the East and Far East.

The modern phase of marine training started in early '20s of the twentieth century. It was the same story of struggle to extract some concessions from an unwilling foreign power. The resolution of Sir P.S. Sivaswamy Aiyer moved, in the Central Legislative Assembly, on 12 January 1922, demanding formation of a mercantile marine committee to consider all aspects of promoting Indian shipping, also contained a clause to establish a nautical college in Indian waters. The Indian Mercantile Marine Committee was formed next year in 1923 which recommended "the establishment of a training school for deck and engine-room staff and the conversion of the Royal Indian Marine Troopship *Dufferin* for the purpose."³⁸ It was only in December 1927 that *Dufferin* was actually converted into a training ship.

The Indian youths, it was alleged, had no aptitude for a seafaring career and the annual admission was restricted to only 30 boys. Nothing could be farther from truth and the charge was almost blasphemous. The authorities conveniently overlooked that as late as the World War I, about 3400 Indian seamen had laid down their lives to safeguard the freedom of the Empire.³⁹ For the first qualifying examination of *Dufferin*, as many as 77 boys appeared. The problem was not that of attracting candidates but that of absorbing them on passing out.

Scindias, inspite of their paternal attitude toward Indian boys, could not absorb all of them. That highlighted

the urgency of forming an Indian mercantile marine. S.N. Haji's resolution on Reservation of the Coastal Traffic Bill of 9 February 1928 also pointed out: "There can be no doubt that the growth of an Indian mercantile marine would prove a powerful factor in the employment of Indian talent."⁴⁰ The Bill amounted to serving a notice on the British shipping to quit Indian waters. The ding-dong battle dragged on till Independence dawned.

After Independence, great emphasis was laid on training of shipping crew on the most modern lines. Maritime training is imparted at three levels - pre-sea, at-sea and post-sea. Pre-sea training is necessary before a person is allowed to take responsibility on a ship. At-sea, experience is the real thing when the trainee actually gets the feel of the ocean swells and wind velocities. Post-sea training is equally important to keep abreast with the latest developments in this age of technological advancement.

Under the colonial administration, the role of Indian seamen was confined to jobs at lower levels and very few could climb up the ladder to become officers. The country therefore inherited a good number of ratings and not many officers. To set right this imbalance, emphasis was laid in free India to train highly qualified officers. Three main institutes were set up for giving training in the art and science of navigation at all levels. These are *Training Ship Chanakya*, Bombay - named after a great son of India who, as Prime Minister of Chandragupta Maurya, laid the foundations of Indian shipping management much ahead of his times. Second is the Directorate of Marine Engineering (DMET) Calcutta, for pre-sea training. The third is the Lal Bahadur Shastri Nautical & Engineering College Bombay, commemorating the Indian Prime Minister who rose to great heights in a very short time. There are other training

organisations run by the state governments as well as by the ports and shipyards to meet their specific needs.

SCI's MTI

Before we deal with these institutes, let us have a look at the one set up by a shipping company which has achieved international recognition. The company is the public sector Shipping Corporation of India which owns nearly 50 per cent of the country's total tonnage and employs over 12,000 persons. Its Maritime Training Institute (MTI), situated on the southern bank of picturesque Lake Powai in north-east Bombay owes its eminence mainly due to efforts of the former SCI Chairman & Managing Director, Dr (now Sir) Chandrika Prasad Srivastava. The training activities of the institute began in July 1987 with a course in fire-fighting.

In February 1988, during the visit of Dr Srivastava, then Secretary General of International Maritime Organisation (IMO) UN, and Vice Chancellor of the World Maritime University, an agreement was signed between IMO and SCI declaring MTI as a branch of the World Maritime University of Malmo, Sweden. The agreement provides for conducting short specialised courses and IMO seminars for Indians as well as for the peoples of Asia and Pacific region. It conducts short courses to meet the special requirements of International Convention on Standards of Training, Certification and Watchkeeping (STCW) for seafarers and other courses required by SCI. Since June 1988, MTI is running all the in-house courses of SCI and holding regular regional model courses and seminars.

TS Rajendra

On aging after being afloat for 67 years, *Dufferin* was scrapped in 1972.⁴¹ The same year on April 16, a new

training ship built by the Hindustan Shipyard, *TS Rajendra*, named after the great South Indian king, Rajraja Rajendra Chola known for his maritime adventures, was commissioned at Bombay. After shifting the establishment of *TS Rajendra* near the seashore in Karave Village (New Bombay) a nautical academy was inaugurated by the Minister of Surface Transport, Mr Jagdish Tytler, on 5 April 1993.⁴² The academy is developed as a self-contained complex for the trainees. It trains deck cadets about international standards and awards a degree in nautical sciences after three-year pre-sea rigorous grounding. The cadets are awarded a certificate of competency as Second Mate of a foreign-going ship after two years of at-sea service and passing a 6-month post-sea course. Four courses of 120 cadets each with an annual output of 480 cadets can be conducted at the academy.

The Directorate of Marine Engineering and Training (DMET) Calcutta, through its 4-year course gives training in marine engineering and awards a certificate equivalent to first class degree in engineering. In addition, the institute at Bombay conducts a compressed 6-month course for graduate engineers to serve on Indian and foreign ships. Candidates passing out from this course are required to undergo a further 9-month training on board before becoming eligible to appear for the second class Part A of the engineers examination. The DMET gets some foreign candidates as well. During 1993, there were 12 foreigners and 495 Indians getting training in the 4-year course.⁴³

LBS Nautical & Engineering College trains navigating and engineering officers in post-sea courses. Every year about 7,500 officers join the college for various long and short term courses pertaining to advanced maritime studies and research. The college attracts a good number of candidates from abroad. During the calender year 1993 (upto

November), the college boasted of 87 foreigners and 8,947 Indians on its rolls.⁴⁴ The college has acquired from Japan a ship handling simulator at a cost of nearly Rs 460 million under the Yen grant-in-aid; a couple of more are in the pipeline.

Several maritime states have set up training institutes to meet their specific requirements. For example, there are three institutes for training ratings: i) *TS Rehman* having an annual capacity to train 300 seamen; ii) BPT-FOSMA Training Institute with a capacity of 360 seamen; and Orissa Maritime Academy to train annually 200 ratings. The government of Kerala is also planning to have a training institute for ratings.

The National Institute of Port Management conducts 3-month pre-sea course for cadets. It has so far conducted twelve courses including Shipmasters Medicare and Marine Communication. The Cochin Shipyard Training Institute runs a 6-month course for graduate engineers. After undergoing a 9-month on board training, they become eligible to appear for second class Part A of the engineers examination.

The Committee on Maritime Education & Training, COMET headed by Dr Srivastava in its report of 1992 has recommended setting up of an autonomous Indian Maritime University (IMU). It will serve as the apex body to plan, coordinate, manage, supervise and monitor all the existing maritime training institutes and suggest modifications. Once IMU comes up, it will streamline maritime training and give it a new vigour. Meanwhile, a public trust called Merchant Marine Education and Research Trust (MMERT) has been set up. The Indian and foreign employees of the shipping industry are contributing to the trust to meet the expenses

of a faculty of eminent scholars. Let us remember that trained and skilled manpower of seafarers and officers are a valuable source of earning foreign exchange. For example, 11 per cent of the total seafarers on Norwegian ships are Indians of whom almost 20 per cent are officers.

Shipbuilding

An entire chapter has been devoted to Indian shipbuilding industry from the most ancient to modern times. Here we will deal with the latest developments after Independence. We have presently five major shipbuilding yards - Mazagon Dock Limited Bombay, acquired by the Government of India in 1960 though it was built by the British in 1769; Garden Reach Shipbuilders and Engineers established at Calcutta in the second half of the nineteenth century and taken over by the Government in 1960; Goa Shipyard which, founded by the Portuguese, was given on lease to Mazagon Dock after liberation of Goa in December 1961, and started functioning independently since 1 October 1967; Hindustan Shipyard Limited (HSL) which was formed in January 1952 but became a full-fledged public sector enterprise in 1961; and Cochin Shipyard Ltd (CSL) set up in 1972 with the Japanese collaboration. The first three are mainly engaged in building naval ships and the last two concentrate on constructing ships for merchant marine. But the distinction is not watertight. For example, Hindustan Shipyard built a survey ship, *INS Darshak*, for the Indian Navy.

All the above shipyards are in the public sector as also a few smaller ones like the Hooghly Dock & Port Engineers Ltd., Calcutta, Rajabagan Dockyard at Calcutta and the Andaman and Lakshdweep Harbour Works. Almost all major ports and shipyards have their own ship repair

dockyards. There are about forty shipbuilding yards in the private sector. Among these, Sirigo Shipbuilding Yard of Chowgule & Co Pvt Ltd is worth mentioning. It can make 1000-ton ore carriers and sail-boats to carry iron ore from Sirigo mines to Marmugao port. The eastern and western coasts are studded with a large number of private boat-building yards. The author saw some at Karwar in Karnataka and Mahem in Bombay which can turn out ocean-going sturdy boats not only for Indians but also for foreign customers - mainly Arabs.

A unique experiment was made at the instance of the Government of India when forty fishing trawlers were urgently required during 1968. A West Coast Consortium of Shipbuilders was formed with Mazagon Dock as leader.⁴⁵ Here the surplus capacity of both the public and private sectors was pooled together to meet the bulk requirement of modern trawlers for deep-sea fishing. The experiment succeeded and the first trawler was launched on 2 May 1969. It proves that great results can be achieved with the combined efforts of all shipbuilding yards to boost up the meagre national tonnage.

But even the capacity of HSL and CSL was not being fully utilised and both were on the verge of closure for want of orders. A remarkable work has been done in the past three years in reviving both and putting them on even keels. For HSL, sale of three ships to SCI has been approved. The IIIrd ship for Andaman Administration, one tug for Vizag port or a dredger for the Bombay port and the repair of *MV Akbar* have also been sanctioned. During 1992-93, a 42,750 dwt bulker was launched. One offshore petrol vessel was delivered to the navy during 1992. In 1993 another petrol vessel for navy and one 27,000 dwt bulk carrier for SCI were delivered.

In the case of Cochin Shipyard, three crude oil tankers of 86,000 dwt each has been constructed and delivered to SCI since 1990-91. The yard is designed to construct ships of 86,000 dwt and repair vessels upto 100,000 dwt. Its order book, having a 009 tanker, two tugs for New Mangalore port and one tug for Tuticorin, is keeping the shipyard busy.

Economic Liberalisation

With the disintegration of the former USSR and the collapse of communism in many countries, free market economy is emerging as a powerful alternative. There is a growing preference for strengthening private sector involving keener competition and improvement in quality of products and services. The process has been accelerated with the advancement in information technology gradually leading to the 'wiring' of the entire globe. Collection, storage and retrieval of vast data has become central to the success of any enterprise. This has impinged upon the methods of management.

India has taken note of these international trends and announced a New Industrial Policy in July 1991. The objectives are to update and adapt the archaic colonial regulations to modern requirements, reduce subsidies to agriculture and industry, open up Indian economy to foreign investors and encourage efficiency, competition and quality, but with a humane face. The Indian Kumbhakaran is waking up from its long slumber. An IMF Managing Director, Michel Camdessus has called it "Tigerisation of India." Some foreign financial institutions and industrialists have started looking at India, with its time tested democratic traditions, as an alternative to China. These are healthy developments which have to be consolidated.

After liberalisation, the shipyards are being permitted to participate in global tenders and match the lowest price. They will also be given an extra cover of 30 per cent. The yards are being given soft loans at 9 per cent interest upto 80 per cent of the cost of ship. Fixation of price will be done in US dollars or Japanese Yen for all stages of payment. These measures have generated a new vigour in Indian shipyards.

In some ways, the liberal policies have helped the industry. Among welcome measures are the following:

1. Automatic approval is now given for:
 - a) Acquisition of all categories of ships by private shipping companies except in case of crude tankers and off-shore supply vessels (OSVs).
 - b) Acquisition of replacement tonnage.
2. No approval of the Director General of Shipping is required for sale of ships or for buying a vessel from an Indian shipyard.
3. Shipping companies have been allowed to retain sale proceeds of their ships abroad and utilise them for fresh purchases of ships.
4. The companies have been allowed:
 - a) To charter out Indian ships
 - b) To acquire vessels through bare boat charter-cum-demise methods
 - c) To have their ships repaired where they deem fit and not at the Indian shipyards alone.
5. The restrictions on availability of foreign exchange have also been lifted. The Quarterly Block Alloca-

tion (QBA) scheme for repair of ships has been altogether dispensed with. The Reserve Bank of India now releases foreign exchange for ship repair/dry-docking and spares for imported capital goods without any limit.

6. Certain sections of Merchant Shipping Act have been amended so that Indian shipping companies may raise external commercial borrowings for foreign ship acquisitions.

It is mainly due to these measures, claims the Ministry of Surface Transport, that the Indian tonnage has increased to 448 vessels aggregating 6.27 m grt as on 31 July 1994.

Liberalisation had some adverse effect on the industry. For example, decanalisation of government cargo would mean that certain import cargoes which were available to Indian vessels under TRANSCHART have now substantially dried up reducing the availability of cargo to Indian flag ships. Thus, even the limited cargo support available to Indian shipping has been diluted.⁴⁶

Secondly, the devaluation of Indian currency has led to depressing effect on the cost of capital of Indian shipping lines. Since most of the ships have to be purchased in international market on dollar basis, the balance sheets of Indian shipping companies have considerably weakened in dollar terms. The foreign currency loans of the shipping companies have now to be revalued generally increasing the debt service obligations of the companies. The net margins available on certain segments of shipping markets such as carriage of dry bulk cargoes, however, have increased in rupee terms on account of devaluation.⁴⁷

Thirdly, in the name of eliminating/reducing subsidies, SDFC which granted loans to shipping companies on the

basis of their needs rather than performance - and that too on nominal interest - has been abolished. In its place the Shipping Credit and Investment Company of India (SCICI) was set up in 1987. This institution provides financial aid to a shipping company at market rates which are exorbitant. "SCICI was also nominated as the agent to Government of India to meet the commitments of the erstwhile SDFC with regard to loans, stage payments, guarantees and counter-guarantees to the banks in respect of external commercial borrowings and shipyard credits."⁴⁸ On the other hand, the Eighth Five Year Plan claims that the "SCICI did a commendable job in financially restructuring the entire private shipping industry as a result of which the private companies were able to reduce their debt liability and improve their viability."⁴⁹ In our view, the SDFC was of greater help in the development of shipping.

Earlier, the government used to provide guarantees to foreign shipyards which facilitated acquisition. This practice has now been discontinued and the foreign banks are reluctant to risk long-term exposure.⁵⁰ The Indian shipping companies have now to depend upon Indian financial institutions which can provide guarantees to foreign EXIM banks covering shipyard credits. The new measures thus are a mixed bag and have to be constantly reviewed in the light of experience.

A Few Suggestions

The imperative need of the hour is to raise the country's shipping tonnage by inducting the right type of modern vessels, and to increase the share of cargo in Indian ships to at least 50 per cent. To achieve these twin objectives - almost complementary - the Government, the public and the

private sector enterprises, should all put their shoulders to the wheel.

The Government has already announced a number of liberal measures to the shipping sector and, if these are properly availed of, it is in a mood to offer further facilities. The public sector has so far played a major role. Nearly 50 per cent of the total tonnage is owned by the Shipping Corporation of India. It is the only company which has a modest fleet of modern container vessels. All large ship-building yards and dry docks are in the public sector.

Generally speaking, the private shipping companies have not made significant contribution. Almost half of the total of 64 companies, own only one or two ships. They have not built any major shipbuilding yard or a dry dock. Most of the funds, they invest in the shipping industry, are raised from the public sector banks or financial institutions like the former SDFC or the present SCICI. There was once a proposal in the Government to nationalise all the private shipping companies. But the subject was not pursued.

In the prevalent environment of emphasis on open market economy, the Government however should not treat shipping at par with other industries. The share of India in the world shipping is woefully low at 1.42 per cent (1992).⁵¹ Of India's total overseas trade during 1992-93, 42.66 million tonnes was taken by Indian lines and the bulk of 79.63 million tonnes in foreign bottoms. It is in carrying POL that the share of Indian ships has risen to 57.3 per cent; in carriage of dry bulk, the Indian share is 23.3 per cent and in general cargo, a mere 14.4 per cent.⁵² It highlights the leeway, the country has to make as also the potential of earning/saving foreign exchange that awaits tapping.

It is well established that shipping industry has peculiar problems and therefore needs strong Government support. The vociferous protagonists of free trade like the USA and UK, Japan and Norway, extend support to their shipping in various forms of fiscal and monetary incentives, widespread tax concessions, interest and other forms of subsidies and cargo support. "American fleet is perhaps one of the most highly subsidised fleet in the world."⁵³

The Government brought into force a new section, 33AC in the Income Tax Act 1961 in April 1990, which allowed some tax concessions to shipping industry. Those concessions were extended to public sector companies in 1993. Under 33AC, the shipping companies could set aside from profits upto twice the amount of their paid-up share capital for creation of a reserve. This reserve is not to be taxed provided it is utilised to acquire new ships for business purposes. It could not be diverted to any other use like paying dividends to shareholders, investment in other companies or remittances outside India or creating any asset in a foreign country. If the fund could not be spent for the required purpose for eight years, it becomes liable to taxation.

This is a well meaning measure meant to raise a tax free substantial amount to be used by the shipping companies to add to the national tonnage. The amount of reserve, instead of being restricted to two times of the paid up share capital, could be increased to four or six times, and will go a long way in helping to buy modern vessels.

Secondly, the SCICI which gives loans to shipping companies at market rates could fix up a maximum interest rate of say eight per cent - which will be anyway twice the

rate charged by the former SDFC - if the amount is utilised only for buying ships. It could also grant a moratorium of three years or so before the payment of instalments fall due. When orders for ships are placed by the shipping companies on foreign shipyards, either the Government or any other organisation like SCICI could offer a guarantee cover which will assure the foreign firms about the security of their loan. Often, if local soft loans are not available, the shipping companies prefer to go to foreign financial institutions.

Thirdly, despite the rising trend for decanalisation of certain items, the Government should continue to offer cargo support to Indian flagships. The share of Indian lines in Government controlled cargo has already gone down from 60 to 55 per cent; further drop is feared. A recent study has revealed that as many as 37 countries, directly or indirectly, provide cargo support to their shipping. "Around 40 per cent of the cargo carried by US flagships were done under US regulations. Japanese steel industry offers around 200 million tonne of cargo to Japanese ships every year. China and EEC also exercise control over shipment of large volume of cargo through f.o.b. purchase."⁵⁴ A salutary practice to be adopted would be to strictly enforce buying on f.o.b. and selling on c.i.f. The US and Japan follow this principle, India could also try to do that.

Fourthly, in modern times when big is regarded beautiful, why not the small private shipping companies form a conglomerate, or merge together. They may then be able to buy more, and modern, vessels which will give them greater bargaining power and economy of scale. But merger is like marriage and has to be done with care.

Fifthly, in their accent on privatisation, the Government has thrown open many areas of port development to private

sector. That will reduce financial burden on the Government and offer immense business opportunities to private companies in India and abroad. Ports have been given broad guidelines to attract private participation in various sectors. These activities include setting up of container and other cargo handling terminals, building of warehousing and storage facilities, maintenance and leasing of port craft and other equipment. That should help in upgradation of ports to handle modern containerised and cellular vessels. Once the peripheral port activities are looked after by private entrepreneurs, the port trusts could utilise their own resources for more important developments.

Already the Government has approved private sector projects worth over Rs.20,000 million to be implemented at major ports. At Kandla, for example, G.P. Corporation, Bangkok, has been allotted a berth to install mechanical bulk-and-break handling facilities. The Bombay Port Trust has entered into an agreement for berth reservation with American President Lines; there are proposals for leasing more berths at Haldia and Calcutta. Berths have been leased to SAIL (Steel Authority of India Ltd) and TISCO (Tata Iron & Steel Company) at Haldia dock complex. Proposals have been approved for setting up dry dock and ship repair facilities at Calcutta, Marmugao, JL Nehru, Tuticorin and Bombay ports with the help of private sector.*

After Independence, a wind of welcome change is blowing over the Indian horizon. The Sun of glorious maritime traditions, which had gone down a few centuries ago, is rising again. Indian shipping is on a steady keel. But it has to sail a long long way to catch up with the modern

* Source: Ministry of Surface Transport.

maritime nations and re-establish its past prestige. "Varuna, the Lord of the heavens above and all the worlds below, knows the path of the birds that fly through heaven, and is also cognisant of the ocean routes along which vessels sail." May he guide our shipping and open up fresh sea routes. शं नो वरुणः 'Be auspicious unto us Oh Varuna!

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Abbreviations

BVB	-	Bharatiya Vidya Bhavan
CHSTAI	-	Chattopadhyaya, Debiprasad - History of Science and Technology in Ancient India
IC	-	Islamic Culture
JBRS	-	The Journal of Bihar Research Society
JMA	-	Journal of Marine Archaeology
MAIOC	-	Marine Archaeology of Indian Ocean Countries (Proceedings of Conference organised by National Institute of Oceanography, Dona Paulo, Goa, 1987)
MHCFE	-	Majumdar, R.C. - Hindu Colonies in the Far East
NISTADS	-	National Institute of Science, Technology and Development Studies, CSIR
PAWD	-	Panikkar, K.M. - Asia and Western Dominance
PMAP	-	Panikkar, K.M. - Malabar and the Portuguese
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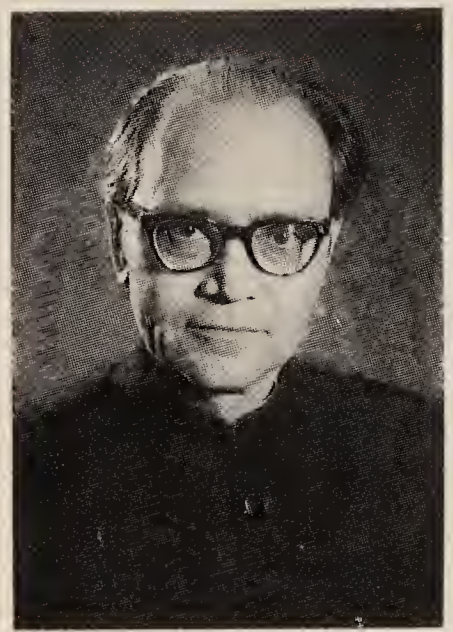
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